VOL. 28 No. 3

BULLETIN

OF THE

TORREY BOTANICAL CLUB

MARCH 1901

Some small-flowered Species of Nemophila from the Pacific Coast

BY ALICE EASTWOOD

(WITH PLATES 15–20)

Nemophila parviflora Dougl. (Trans. Linn. Soc. **17**: 275) has been an appropriate name under which all the small-flowered *Nemophilae* of the Pacific Coast have been placed. In this heteromorphous collection, as described in Gray's Synoptical Flora of North America (**2**: 156), two synonyms are recognized. These are *N. heterophylla* Fisch. & Mey. (Sert. Petrop. 1846. *pl. 8*), and *N. pdunculata* Dougl. (Trans. Linn. Soc. **17**: 275). Since the publication of the second edition of the Synoptical Flora, (Jan. 1, 1886), two small-flowered species have been published, *N. spatulata* Coville (Contr. Nat. Herb. **4**: 156), and *N. sepulta* Parish (Erythea, **7**: 93).

Small-flowered *Nemophilae* have been for years accumulating in the Herbarium of the California Academy of Sciences and have either been put with the undetermined species or labelled *N. parviflora*.

Considerable observation in the field added to a knowledge of these herbarium specimens has convinced the writer that, instead of one species with small flowers, there are many. This is undoubtedly one of the genera so common in California and so puzzling, where the evolutionary impulse is very strong and where new species are now being evolved.

If these *Nemophilae* had been large-flowered, numerous species would have been recognized long ago, as the differences in the

[Issued 27 March.]

corollas alone would have been sufficient to attract attention. In all, there is great variability in the leaves, some species having scarcely two leaves alike on the same plant. The calyx generally changes with age, becoming larger and thinner in fruit with the venation more evident. The auricles also change and are often wanting or abortive. The style grows after the flower expands and the style branches become more divaricate. When the corolla falls, they usually surpass the calyx. In all the species examined, the flowers proved to be hermaphrodite.* All are

---

* NEMOPHILA PARVIFLORA (Dougl. MSS.), foliis pinnatifidis, lobis paucis latis subdentatis, calycis sinubus breviter appendiculatis, corollis calycem vix superantibus, placentis 2 ovulatis.

Flores parvi. Calycis appendiculi saepius brevissimi interdum evanidi, rarius post anthesin elongati. Squamae corollinae parvae, angustae.

Received both from Mr. Douglas and Dr. Scouler from the Columbia.

N. PEDUNCULATA (Dougl. MSS.), foliis pinnatifidis, calycis sinubus breviter appendiculatis, corollis calycem vix superantibus, placentis 6-ovulatis.

Habitus, calyx, corolla omnino *N. parviflorae*. Folia angustiora, longius petiolata, lobis magis integris distinctisque.

Gathered by Mr. Douglas on the Columbia.

Copied from the original place of publication, Trans. of Linn. Soc. 17: 275.

NEMOPHILA HETEROPHYLLA Fisch. & Meyer

N. pilis setulisque rectis adspersa: foliis superioribus sparsis dentato-lobatis, inferioribus oppositis subpinnati-sectis: segmentis petiolulatis rotundatis sinuato-lobatis, superioribus basi confluentibus: corolla subpelviformi: lineis inter stamina membranaceo-alatis glabris: seminibus corrugato-verrucosis, arillo calyptraeformi. Annua, gracilis, subdichotomo-ramosa, ramis elongatis. Caulis, rami atque pedunculi setis rectis reversis adspersi, subglabri. Folia inferiora opposita, petiolo longo gracili basi modice dilatato ibique pilis longis ciliato fulta, setulis pilisque longioribus adspersa, subpinnatisecta: segmentis ovato-subrotundis, 3 lin. circ. in diametro vel paulo majoribus, saepius sinuato-lobatis (lobulis rotundatis), interdum integerimis, inferioribus petiolulatis, summis tribus basi confluentibus: folia superiora sessilia, rarius opposita, plerumque sparsa, oblonga, dentato-lobata, basi cuneata ibique pilis longis barbata. Pedunculi solitarii, uniflori, gracillimi, in fructu declinati. Flores quad formam *N. atomariae* similes, sed paulo minores. Calyx hispidissimus: laciniis sub ovatis 2½ v 2 lin. longis: appendicibus multo minoribus, subovatis. Corolla calyce duplo longior, coerulea, impunctata, subpelviformis, fundo glaberrima: alis inter stamina membranaceis per totam longitudinem adnatis utrinque attenuatis subciliolatis notata. Stylus basi hispidus. bifidus, stigmatibus subcapitatis. Capsula generis, disperma (semper?). Semina flavescentia, ovata, corrugato-verrucosa, verrucis rotundatis: arillus calyptraeformis.

Hab. in Nova-California ad sinum Bodega.

Fisch. & Meyer. Sert. Petrop. 1846. Descr. with plate 8.

NEMOPHILA SPATULATA Coville

Annual, branching from the base, more or less appressed-hirsute throughout: branches procumbent, usually less than 10 cm. long; cotyledons oblong to spatulate, entire, petiolate; leaves opposite, spatulate. tapering into a margined petiole, coarsely 3–5-toothed, never pinnatifid at the apex, the teeth broad, acute or obtuse, entire: pe-

more or less hispid with fine or stiff bristles or hairs which on the stems and peduncles are spreading or appressed downwards, on the leaves and floral organs are upwardly appressed. The appendages at the base of the corolla differ in plants from different localities and have been taken as the chief distinguishing specific characteristic. These appendages are often difficult to discover, being so thin and small. It was learned by experience that, after the dried flower had been softened and spread out so as to show the form of the parts; if then, the corolla were allowed to become almost dry, there was a stage when the form and character of the appendages could be delineated. The color of the flowers is not known except in a few instances. This is owing to the changes incident to drying, poisoning, and age. The anthers in all the dried flowers are black or dark brown, either ovate or oblong-ovate with pointed apex and the base either cordate or sagittate.

In the figures which have been made of the flowers and leaves, the parts of the flowers have been enlarged five times, the leaves are the natural size. Where the leaves vary greatly so that no one leaf could be considered typical the outlines of more than one are drawn.

Whether all the species here described and named are finally recognized as species makes very little difference, the main object of the paper being to call attention to these plants so as to interest others in the numerous forms and provoke study and observation in the field. Except in a few instances, a series of specimens has not been available for examination. It would be well for the student to examine many flowers on the same plant and on many plants of similar appearance in any one locality to learn whether the form of the scales of the corolla is an individual or specific characteristic. In all cases where a series has come under the

---

duncles shorter than the leaves, reflexed, at least in fruit: calyx 1–2 mm. long, its lobes ovate-lanceolate, acute, the appendages lanceolate, acute, about one half as long as the lobes: corolla broadly campanulate, slightly exceeding the calyx or sometimes shorter: internal scales none: filaments about as long as the corolla tubes: anthers ovate: ovary globular-ovate, hispid: stigmas sessile: capsule depressed, and just before dehiscence slightly compressed: seeds 4, globular, 1.5 to 2 mm. in diameter, pale brown, with few or no pits, sparingly scaly and with a conspicuous but deciduous caruncle.

Type specimen in the United States National Herbarium, no. 1671. Death Valley Expedition; collected August 21, 1891, in Whitney Meadows, Sierra Nevada, Tulare County, California, by Frederick V. Coville.

observation of the author the differences in the shape and insertion of these scales appear to be specific.

None of the old names, *parviflora*, *heterophylla*, *pedunculata*, have been assigned to any of these species. If, in ignorance of the types, the writer has made any synonyms, no great harm is done and the result will be less confusing than if old names were applied to new plants. The chances of making synonyms are less in the former than in the latter case, since *N. parviflora* and *N. pedunculata* were both originally collected on the Columbia River and are probably not natives of California; while *N. heterophylla* was collected at Bodega Port, a place with many plants peculiar to itself.

The species seem to naturally arrange themselves into the following sections.

Section I. Corolla tubular, minute. 1. *N. humifusa* Kellogg. 2. *N. sepulta* Parish. 3. *N. quercifolia* Eastwood. 4. *N. Austinae* Eastwood. 5. *N. macrophylla* Eastwood.

Section II. Corolla tubular-campanulate. 6. *N. inconspicua* Eastwood. 7. *N. pustulata* Eastwood. 8. *N. Kelloggii* Eastwood. 9. *N. micrantha* Eastwood. 10. *N. Plaskettii* Eastwood.

Section III. Corolla salverform. 11. *N. exilis* Eastwood.

Section IV. Corolla open campanulate. Depressed plants with a tendency to bury the fruits in the ground. Flowers rather large, leaves small, not deeply lobed. 12. *N. humilis* Eastwood. 13. *N. nana* Eastwood. 14. *N. Congdoni* Eastwood.

Section V. Corolla open-campanulate, approaching tubular-campanulate. Stems long and weak, with long internodes. Leaves lobed, generally unequal on the two sides. 15. *N. flaccida* Eastwood. 16. *N. inaequalis* Eastwood.

Section VI. Corolla rotate-campanulate or pelviform. Stems widely branching, usually weak and with long internodes. Leaves with some of the divisions petiolulate. 17. *N. hispida* Eastwood. 18. *N. divaricata* Eastwood. 19. *N. tenera* Eastwood. 20. *N. gracilis* Eastwood. 21. *N. nemorensis* Eastwood. 22. *N. glauca* Eastwood. 23. *N. fallax* Eastwood. 24. *N. exigua* Eastwood. 25. *N. pulchella* Eastwood.

Section VII. Corolla almost rotate with short tube and campanulate limb. Stems branching, winged. Leaves regularly cleft. 26. *N. alata* Eastwood.

Section VIII. Corolla rotate, without tube. 27. *N. rotata* Eastwood.

1. **Nemophila humifusa** Kellogg in herb. sp. nov.

Stems depressed, spreading in close mats and very prolific, appressed hirsute-canescent with hairs strongly deflexed: leaves opposite pinnatifid with lobes subdivided, somewhat setaceously mucronate: flowers from all the axils even the lowest on deflexed peduncles which bury themselves in the sand when in fruit: divisions of the calyx about ¾ shorter than the corolla with conspicuous auricles half as long as the sepals, spreading or deflexed: corolla white or whitish, about 2 mm. long, tubular with lobes about as long as the tube, entire or slightly toothed at apex, sparingly hispid on the back, bearded in double lines at the base within: filaments inserted a little above the base, equal or longer than the tube: anthers oblong, mucronate: capsule globose, purplish or pinkish with dark base and striated with dark purple lines vanishing towards the style, hirsute with ascending, appressed white hairs, 6–8-seeded: seeds oblong, corrugated, spotted with white scales (these soon deciduous), the calyptra stipe-like with a bract on the one side like a handle to a dipper.

This abounds in the sand hills of San Francisco and blooms very early in spring, flowering as soon as it reaches the surface of the ground and marvelously laden with fruit on the under side.

This is Dr. Kellogg's description with a few additions by the writer. It was read before the California Academy of Sciences April 3, 1878, according to the heading at the head of the description.

Besides the specimens collected by Dr. Kellogg and mounted on the same sheet with the description in his handwriting, there is a specimen collected by Mrs. Brandegee in May (year not given), another by the same collector from Point Lobos, San Francisco, April 17; another from Lake Merced, San Francisco, collected by the writer, February 25, 1895; another, by the same collector, from Warthen, Fresno County, May 11, 1893; one without flowers, from Epperson's, collected by Mr. T. S. Brandegee in 1888.

There is a variation from the typical form which has been collected by the writer at Cuyama, on the boundary between Santa Barbara and San Luis Obispo Counties and also on Stony Creek on the San Miguelito Ranch, near Jolon in the Santa Lucia Mountains, Monterey County. This is characterized by smaller,

less dissected leaves, narrower and longer calyx divisions with the auricles much longer, much more slender peduncles and more slender stems and more open habit of growth. The general shape of all the parts is about the same.

2. NEMOPHILA SEPULTA Parish, Erythea, **7**: 93

Hirsute; stems 5–8 (rarely 15) cm. long, procumbent; leaves usually approximate, opposite, oblong in outline, 12 mm. (rarely 5 cm.) long, the lower half narrowed into a margined petiole, above pinnately parted nearly to the midrib into 5 or 7 equal, oblong, entire, mucronulate lobes: flowers on slender peduncles, soon deflexed, and burying the capsule more or less in the soil: lobes of the calyx triangular-acuminate, ciliate, the appendages nearly as long as the lobes: corolla very small (4–6 mm. in diameter), little exceeding the calyx lobes, white, its appendages minute, consisting of narrow, vertical folds, ciliate with 1–3 short hairs: ovules 4: mature capsule 4–6 mm. in diameter, much exceeding the calyx lobes: seeds 4, irregularly triangular, rounded on the back, obscurely pitted, and with a conspicuous caruncle.

In rich soil, in meadows at Bear Valley, 6,500 ft. alt., in the San Bernardino Mountains, June, 1895, 3782 Parish, and other distributions. In some respects approaching *N. Menziesii* H. & A., from which it differs in its condensed and prostrate habit, much smaller flowers, less deeply parted style, and notably in the number and shape of the much larger seed.

3. **Nemophila quercifolia** sp. nov.

Stems decumbent or ascending, branching chiefly from the base, 10–15 cm. long, angled, cinereous with dense, fine, white, spreading bristles: internodes longer than the leaves or peduncles, 5 mm.–3 cm.: leaves opposite, ovate to ovate-oblong and suborbicular, crenately five-lobed, with the lobes again crenate or entire, 10–15 mm. long, 10–12 mm. wide, densely appressed hairy with stiff and fine hairs intermixed, somewhat pustulate at base; upper leaves almost sessile, lower on petioles somewhat longer than the blades: peduncles becoming spreading-recurved in fruit, the upper longer than the leaves, the lower ones shorter: calyx with oblong acute divisions, 2–3 m. long, 1 mm. wide, hairy on both surfaces, veins apparent: auricles short, narrow, linear, deflexed-spreading: corolla tubular, 3 mm. long, with the rounded divisions sometimes equal, shorter than the tube; appendages 2 narrow plates close to the base of the filaments, glabrous: filaments inserted above the base, longer than the tube of the corolla:

anthers small, cordate: ovary densely hispid: style shorter than the calyx with divisions half the entire length, hairy at base: pod globular, hispid: seeds 2, globular, scrobiculate: calyptra stipe-like, deciduous.

This grows in the neighborhood of *Sequoia gigantea* in the woods of Fresno County. It was first collected by Mr. T. S. Brandegee at Comstocks, near Sequoia Mills, July 24, 1892, in fruit, and by the writer in flower at Sequoia Mills, May, 1894.

It belongs to the group with corollas tubular and comes nearest to *N. sepulta* Parish. A comparison of the figures illustrating the two species will show some of the differences. The two are quite unlike also in habit, *N. quercifolia* being much more sparsely flowered and with much longer internodes. Apparently *N. quercifolia* does not bury its capsules in the ground as is the case with *N. sepulta*.

4. **Nemophila Austinae** sp. nov.

Branching from the base and dichotomously above with the stems slender, weak, decumbent or ascending, clothed with a few, scattered, deflexed bristles: internodes 2–3 times as long as the leaves, 1–6 cm.: cotyledons oval, 1 cm. long on petioles of the same length or slightly longer: leaves ovate in outline, 1–2.5 cm. long, 5–18 mm. wide, 5–7-lobed with rounded entire or lobed divisions and broad rachis, mucronate; base cuneate, tapering to margined petioles (texture thin and veiny, the surface clothed with fine, closely appressed hairs): petioles connate-clasping at the dilated base, as long as or shorter than the blades, almost wanting on the upper leaves: peduncles slender or rarely stout, recurved, somewhat tortuous, surpassed by the leaves: calyx with triangular-subulate divisions, 3 mm. long, 1 mm. wide, hairy on the outer surface and on the inner near the apex: auricles linear, more than half as long as the sepals, deflexed: corolla tubular, slightly spreading, 3.5 mm. long, with retuse divisions not so long as the tube, each with 2 short rows of hairs at base between the stamens: stamens inserted above the base, about as long as the tube: anthers heart-shaped: ovary globular, not hispid on the lower part, nor densely so on the upper: style divided half way, very short: seeds two, corrugated, with the caruncle covered with a shallow, cap-like calpytra which is neither bracted nor stipe-like.

This was collected by Mrs. R. M. Austin on Davis Creek, under trees, June, 1885. It is named in honor of Mrs. Austin whose

collections have been so valuable in furthering the knowledge of the flora of California.

It comes nearest to *N. humifusa* Kellogg but is of different habit, foliage, capsule, seed, and with a corolla of a different shape.

5. **Nemophila macrophylla** sp. nov.

Stems weak, procumbent or supported by other plants, retrorsely hispid with scattered bristles, branching, ribbed: internodes generally longer than the leaves becoming 8 cm. or more: leaves opposite or alternate near the ends of the branches, thin, ovate-orbicular in outline, variously lobed and divided, often with the three upper lobes confluent, cuneate in outline, the lower more spreading, often lobed or toothed, obtuse at the rounded apex; blades 1–4 cm. long, almost as wide as long; petioles slender compared with the leaf, dilated and connate clasping at base, about as long as the blades; the appressed bristles on the surface scattered but dense on the petioles: peduncles long, slender, spreading or recurved in fruit, longer than the petioles: calyx enlarging noticeably in fruit, the divisions in flower oblong, acute, 3 mm. long, hispid on both sides, more densely so on the outer: auricles blunt, 1 mm. long: corolla slightly surpassing the calyx, tubular, the tube longer than the oblong divisions, hispid externally and ciliate at apex; appendages at base of 2 narrow scales which are ciliate on the free edge, about 1 mm. long: stamens as long as the tube of the corolla, inserted near the base: anthers ovate: ovary hispid at summit: style divided below the middle: pod purplish: seeds 4, coarsely pitted, the calyptra stipe-like.

This strange looking *Nemophila* was collected by the writer near the Sur River in Monterey County, June 16, 1893. It grew in a shady place.

It comes near *N. micrantha* but differs in habit, foliage, shape of calyx, size of corolla and shape of appendages.

6. **Nemophila inconspicua** sp. nov.

Branching widely from the base, decumbent, with branches 3–15 cm. long, slender, clothed with a few retrorse bristles: internodes shorter or longer than the leaves, from .5 to 5 cm.: leaves spatulate in outline, 3–5-lobed, generally with one lobe on one side, two on the other, tapering to a broad margined petiole which is connate-clasping at base when there is an opposite leaf; lobes similar to broad teeth, mucronate; surface with the hairs soft, loosely appressed, denser on the lower surface: peduncles equalling or exceeding the leaves, spreading or nodding in fruit: calyx

with the divisions triangular-subulte, not quite 3 mm. long, a little more than 3 mm. wide, hairy on both surfaces, more densely so on the outer: auricles linear-subulate, 1 mm. long, deflexed, corolla blue, tubular-campanulate, 4 mm. long, the obovate divisions as long as the tube, hairy on the outside and with a double row of hairs between the filaments on the inside: stamens inserted at the base, filaments equalling the tube, anthers ovate-oblong: ovary hispid on the upper part: style short, 1 mm. long, divided less than half way, hairy below the forks: seeds 3 or 4, verrucose-corrugated: caruncle covered with a shallow deciduous calyptra.

This was collected by the writer at Bearskin Meadows on the trail from Millwood to Kings River Cañon, July 1, 1899.

It appears to be near *N. spatulata* Coville of which no specimen is available for comparison. It is apparently not the same, since *N. spatulata* is described as without appendages on the tube of the corolla and with sessile stigmas.

7. **Nemophila pustulata** sp. nov.

Stem branching from the base, apparently somewhat fleshy, ascending or erect, angled, hispid with retrose bristles which are minutely pustulate at base: internodes 2–3 times as long as the leaves, 1–3 cm.: leaves opposite, broadly oval or ovate in outline, with 5 divisions, the 3 upper confluent, the 2 lower cut almost to the base: petioles of lower leaves longer than the blades; upper shorter, both connate-clasping at the dilated base; divisions oval, sometimes dentate, usually entire, mucronulate: peduncles shorter than the leaves, but elongating after anthesis and deflexed: calyx very hispid on the outer side, less so on the inner near the apex: divisions triangular-subulate, 2 mm. long, 5 mm. wide at base: auricles small, strongly spreading deflexed: corolla tubular-campanulate, 4 mm. long, with retuse divisions a little shorter than the tube, hairy on the outside and slightly ciliate at the apex; appendages at base attached by the short side near the filaments, the free part subulate with some hairs at apex: stamens with filaments as long as the tube inserted above the base: anthers small, heart-shaped: ovary densely hispid: style divided about half way: seeds and fruits not seen.

This is very near *N. micrantha* and may prove to be only a form of that species. The plants from which the description is drawn are young and the differences in habit may be due only to the immaturity. The leaves are more regular and the appendages on the corolla tube dissimilar. The pubescence of the entire

plant is characterized by a roughness caused by the pustules at the bases of the hairs.

The specimens from which the description is made were collected by John Macoun in the vicinity of Vancouver, May 6, 1893 (no. 667).

8. **Nemophila micrantha** sp. nov.

Stems becoming long and lax, decumbent or supported by other plants, some of the stems 3 dm. long, winged, more or less retrorsely hispid: internodes 2 or 3 times as long as the leaves, 1–14 cm.: leaves opposite, various, regularly or irregularly 3–5-lobed, with the lobes dentate or entire, broadly ovate in outline or one-sided, cuneate at base; lowest leaves with the two lowest divisions petiolulate, surface hispid with regularly appressed hairs which are more abundant on the lower surface: petioles equalling or shorter than the blades, dilated and connate-clasping at base: flowers from the lowest axils with peduncles that elongate and are recurved in fruit, generally shorter than the subtending leaves: calyx with triangular-subulate divisions about 2 mm, long, veiny, very hispid externally, slightly so on the inner surface: auricles very short, spreading: corolla tubular-campanulate, 3 mm. long, divisions shorter than the tube, retuse at apex; appendages consisting of a pair of narrow scales which are ciliate along the free edge: stamens inserted a little above the base of the corolla, about as long as the tube: anthers small, heart-shaped: ovary and lower part of style very hispid, the latter divided about to the middle: capsule containing 2–4 orbicular seeds with deciduous, stipe-like calyptra; the surface of the seeds obscurely corrugated and minutely pitted.

This grows in shady places under brush and trees in the region of *Sequoia sempervirens*. Specimens examined from Mount Tamalpais, Lagunitas, Mill Valley, Fairfax, all in Marin County, and collected by the writer, from March to August; Big Tree Grove, Santa Cruz Mountains, collected by Mrs. Brandegee, May, 1887. No. 742 of the collection of H. E. Brown, from near Mendocino, is probably the same species but differs somewhat from the form common in Marin County.

There seems to be some variation in the size of the leaves and the flowers, but in the main the distinguishing characteristics are constant. The appendages on the corolla tube are difficult to find, being very small and thin. They are attached by the shortest side, the free part of each pair being linear-subulate and inclined towards the other.

9. **Nemophila Kelloggii** sp. nov.

Stems long, slender, lax, weak, decumbent or supported by other plants, somewhat retrorsely hispid, ribbed, becoming more than 2 dm. in length: internodes becoming 10 cm. long: leaves opposite, ovate to orbicular in outline, 1–3 cm. long and of about the same breadth, generally 5-lobed with lobes subequal, the upper 3 more or less confluent and cuneate at base, the lower two oblong or elliptical, entire or lobed, veins evident, thin in texture, hispid with appressed hairs which are denser on the lower surface and less regular on the upper surface, inclined to be postulate at base; petioles equalling or shorter than the blades, dilated and clasping at base, hispid and bristly ciliate: peduncles shorter than the leaves, spreading in flower, nodding after anthesis: calyx with linear oblong divisions, 2–2.5 mm. long, extending almost to the base, hispid externally, sparingly so near the apex on the inner surface, veiny: auricles small, deflexed, sometimes wanting, corolla tubular-campanulate, 3 mm. long with the divisions as long as the tube, hispid on the outside: divisions a little more than 3 mm. broad, emarginate or obtuse at apex: appendages consisting of two linear scales, the free sides folding towards each other, ciliate on the margin: stamens about as long as the tube of the corolla, attached a little above the base: anthers small, cordate: ovary densely hispid: style divided about the middle: capsule globular: seeds 2–4, with a stipe-like calyptra about as long as long as the seed.

This was collected by Dr. A. Kellogg and Mr. McLean in the Santa Cruz Mountains in 1876.

While it is near *N. micrantha* it seems best at present in view of the differences in foliage, flower and seed, to consider it distinct.

10. **Nemophila Plaskettii** sp. nov.

Stems erect, branching from the base and dichotomously above, 4-angled, rather stout, cinereous, the stem bristles rather few, downwardly appressed: internodes twice as long as the leaves, 1–7 cm.: leaves broad, oval to ovate in outline, 1–2.5 cm. long, 1–2 cm. wide, 5-lobed, the three upper lobes somewhat confluent, the two lower petiolulate, entire or lobed, appressed hairy; petioles about as long as the blade except on the uppermost leaves, dilated at base and connate-clasping; first leaves orbicular or oval, on petioles two or three times the length of the blades: peduncles erect in flower, deflexed and inclined to be tortuous in fruit, about as long as the petioles on the lower leaves: calyx with triangular subulate divisions, 2 mm. long, densely hispid on the outer surface,

less so on the inner: auricles very short, deflexed, greener than the calyx divisions: corolla tubular-campanulate, 5 mm. long, with rounded, retuse lobes extending almost half way; appendages at base very small and thin, scarcely evident: filaments equalling the corolla tube, inserted above the base: anthers cordate: style divided almost to the base with large, capitate stigmas: ovary densely hispid: capsule 2–3-seeded with the seeds corrugated-verrucose and having a stipe-like calyptra.

This is close to *N. micrantha* but differs in the flowers as can be seen by comparing the figures and also in a stouter habit and more divided leaves.

It was collected by Mr. R. A. Plaskett on Willow Creek, Santa Lucia Mountains, Monterey County, February 27, 1898. It is no. 32 of his distribution and is named in his honor.

11. **Nemophila exilis** sp. nov.

Stems slender, branching widely from the base, the upper branches horizontal or declined, hispid throughout and cinereous with numerous spreading bristles, varying in length and on the old parts, pustulate at base: internodes generally longer than the leaves, 1–6 cm: leaves opposite, alternate at the upper part, entire or 2–5-lobed, often unequal on the two sides, varying extremely on the same plant; lobes broadly dentate or suborbicular, mucronate, base cuneate, tapering to a broad margined petiole, generally shorter than the blade, the upper leaves sessile; pubescence as on the stems and peduncles except the general direction of the bristles: peduncles surpassing the leaves, slender, spreading horizontally with the fruiting calyx nodding at the end: calyx deeply divided with linear-acuminate divisions, 4 mm. long, 1–2 mm. wide, veiny, hairy on the outer surface only: auricles 1 mm. long, spreading, deflexed, linear, acute: corolla salverform with campanulate tube 4 mm. long and a spreading border of suborbicular divisions, which are obtuse, emarginate or retuse at apex, between 3 and 4 mm. long and 2–3 mm. wide, slightly hairy externally, and generally sparingly ciliate at apex: basal scales glabrous, 3-sided, attached by the longest side on each side of a filament, the free part with the upper side longer than the lower: stamens with filaments as long as the tube of the corolla, attached at the base: anthers oblong-ovate: style slender, divided to the middle: ovary densely hispid: capsule globular, hispid, mottled: seeds wanting.

This was collected on the Hog Ranch Road, Tuolumne County, California, by J. W. Congdon, June 9, 1897.

While the corolla approaches those that are tubular-campanulate, it is distinctly salverform, though the tube is short and broader at the top than at the base.

12. **Nemophila flaccida** sp. nov.

Bright green: stems weak, decumbent, much branched, almost glabrous on the older parts, sparingly retrorsely hispid on the younger, becoming 3 dm. or more in length: internodes 2–3 times as long as the leaves, the lowest ones 6–9 cm.: leaves alternate, thin, with the veins scarcely evident, variously dentate or lobed, scarcely two leaves alike on the same plant; lower leaves 3–5-lobed with the 3 upper lobes confluent, the 2 lower often petiolulate and with the 2 sides unequal; upper leaves variously dentate, lobed or almost entire, sessile with the general outline ovate: petioles winged, dilated at base: peduncles long, capillary, spreading, with the flowers nodding after anthesis, surpassing the leaves, 1–3.5 cm. long: divisions of the calyx triangular-subulate, extending almost to the base, 4 mm. long, 1 mm. wide, veiny, glabrous on the inner surface except near the base of the ovary, hispid on the outer and on the margin: auricles small, acute, deflexed: corolla rotate-campanulate with the tube shorter than the obovate, obtuse or emarginate divisions, externally hairy: appendages attached near the stamens, the free side rounding, ciliate or fringed: filaments longer than the tube of the corolla, inserted at the base: anthers oblong: ovary densely hispid above the disk at base: style slender, divided to the middle, equalling or shorter than the calyx: pod globular, 2–4-seeded: seeds with calyptra stipe-like, corrugated, verrucose.

This was collected by H. E. Brown near Pitt River, Shasta County, May 15–18, 1897 (no. 261). A specimen collected by the writer between Ukiah and Orr's Hot Springs is for the present placed under this species. The material is too poor for certainty but the appearance of the plants is the same. This last specimen was collected by the author June 22, 1894.

13. **Nemophila inaequalis** sp. nov.

Stems slender, weak, apparently decumbent, 3 dm. or more long, retrorsely hispid with weak bristles: internodes 1–6 cm. long: leaves alternate, occasionally opposite, unequal on the two sides, 2–4 cm. long, 1.5 cm. wide, generally 5-lobed on one side, 2–3-lobed on the other, tapering from the lowest lobe to the broad petiole which is clasping at base, generally shorter than the petiole,

margined and ciliate; lobes orbicular-oblong, obtuse or mucronulate, sparingly hispid with appressed hairs, the lower surface paler than the upper; upper leaves almost sessile: peduncles almost as long as the subtending leaves, slender, erect in flower, somewhat spreading after anthesis: flowering calyx 4 mm. long with 5 linear-lanceolate divisions which extend almost to the base, veiny, very hispid externally, slightly so on the inner side near the apex: auricles short, subulate, deflexed: fruiting calyx becoming 6–7 mm. long, the auricles lengthening in the same proportion: corolla tubular-campanulate, the 5 oblong-obtuse divisions as long as the tube, together 5 mm. long: appendages at base attached near the base, sword-shaped, 1 mm. or more in length ascending on each side of a filament, apparently crossing: stamens about as long as the tube, inserted a little above the base: anthers dark brown, ovate: ovary hispid with dense, white hairs: style divided to the middle: capsule containing 2–4 orbicular seeds with convoluted surface and the calyptra scarcely protuberant.

This was collected on the Russian River, June, 1886, by T. S. Brandegee.

14. **Nemophila humilis** sp. nov.

Low, 5 mm.–6 cm. high, with a few branches from the base, cinereous throughout. First leaves oblong-spatulate entire, 5–10 mm. long with petioles shorter than or slightly longer than the blades: leaves opposite, spatulate in outline, 3–5-lobed, often irregular or unequal with a cuneate base which merges into a broad petiole about equalling the blade; lobes of the leaves tooth-like or obtuse and mucronulate: flowers from the lowest axils, pale blue, on peduncles which are at first erect but later are reflexed, becoming 5–8 mm. long: calyx with oblong, acute lobes, 3 mm. long, 2 mm. wide near the base, veins scarcely visible, hairy on both surfaces, the margin fringed with long uneven hairs: auricles linear, ⅓ as long as the sepals: corolla open campanulate with spreading limb and tube ⅓ as long: divisions obovate, 3 mm. long, 2 mm. wide, with emarginate apex and throat hairy but without distinct appendages: filaments inserted at the base of the corolla, about as long as the tube: anthers small, pointed: ovary densely hispid from below the middle: style divided about half way, very short: capsule with 5 seeds: these immature almost orbicular, 2 mm. in diameter with the calyptra prominent, cap-like, apparently soon deciduous.

This species was collected by the writer on the trail between Summit and Summit Soda Springs, in Placer County, June 9, 1898. It grew on a bank where the ground was still wet from the recently melted snow.

It approaches the large-flowered group more than any of the species described in this article.

15. **Nemophila nana** sp. nov.

Low, branched from the root and with short procumbent stems 2–5 cm. long, hispid throughout with appressed hairs which are minutely pustulate at the base, wing-angled: leaves opposite, crowded, elliptical in outline, 1–1.5 cm. long, 5–7-lobed with the lobes opposite or alternate; divisions ovate-elliptical, mucronate: petioles as wide as the rachis and about as long as the blade, dilated and connate-clasping at base, somewhat decurrent, forming the winged angles of the stem, ciliate especially near the base: flowers blooming from the earliest leaf axils: peduncles at first erect, later recurving as if to bury the seeds, 5–15 mm. long, almost as broad as the petioles: calyx divisions triangular-subulate, 2 mm. long, often 1–2 mm. wide, hispid on both surfaces, with long hairs on the margin: auricles linear, more than half as long as sepals, though sometimes mach shorter and almost obsolete. Corolla open-campanulate, pale blue with darker dots in lines, 5 mm. long, with obovate, emarginate divisions almost twice as long as the tube; appendages attached near the base of the filaments, curved towards the stamens, minutely hairy on the free edge: stamens with filaments a little longer than the tube, inserted at the base: anthers cordate: style divided half way, hairy at base, the pointed apex of the style broadening to it: ovary hispid especially on the upper part: capsule 5-seeded: seeds 2–5 mm. long, obtusely angled, brown, covered with scattered white scales: calyptra cap-like.

This was collected by the writer February 12, 1900, on the old road to Bartlett Springs from Upper Lake in Lake County. It grew on a moist bank alongside the road on the side of the mountain towards Upper Lake and was seen in several localities. The flowers are pale blue and so buried among the leaves as to be scarcely visible.

16. **Nemophila Congdoni** sp. nov.

Low with assurgent stems, branching from the base, sparingly hispid with downwardly spreading hairs, ribbed; internodes shorter than the leaves, about 1 cm.: leaves opposite, oblanceolate to spatulate, entire, lobed or toothed, tapering to a short broad margined petiole or the uppermost sessile: pubescence white-hairy, appressed: peduncles from the lowest axils, rather stout, declined, somewhat tortuous, apparently burying the fruits in the ground: calyx with linear lanceolate divisions, hairy on both

surfaces, 5 mm. long, 1–2 mm. wide: auricles subulate, strongly declined, 2 mm. long: corolla open-campanulate with the divisions longer than the tube, 8 mm. long: divisions obovate, emarginate or obtuse at apex, 4 mm. wide: appendages consisting of 2 laciniate scales attached close to the filaments by one side, the apex with a few long hairs: there are a few hairs also in the tube of the corolla: stamens with filaments as long as the tube and inserted a little above the base: anthers oblong, cordate at base: ovary densely hispid: style divided to the middle, in flower shorter than the calyx: seeds 4, with cap-like calyptra The calyx enlarges considerably in fruit.

This was collected by J. W. Congdon on the Tioga Road, July 6, 1896. There is a specimen collected by the same botanist on the Road to Hetch-Hetchy, June 7, 1897. This is without flowers and so is uncertain. The species is named in honor of the well-known botanist, its discoverer.

17. **Nemophila hispida** sp. nov.

Stems slender, erect, dichotomously branching above the base and becoming decumbent, rough and hispid with fine, white, stiff bristles, ribbed: internodes generally longer than the leaves, becoming 6 cm. or more: first leaves orbicular, 5 mm. wide, on long petioles; lower leaves opposite; upper alternate, 1–4 cm. long, elliptical in outline, with 7–9 divisions; lower divisions petiolulate, upper somewhat confluent, all lobed and the lobes mucronulate; upper surface with bristles appressed, lower with bristles more spreading: petioles as long as or shorter than the blade, densely hispid-ciliate, dilated and connate-clasping: peduncles as long as or shorter than the leaves, retrorsely hispid, spreading but with flowers nodding after anthesis: calyx with lanceolate, acute divisions, 3 mm. long, hispid on the outside, glabrous within, somewhat veiny: the auricles linear, ¼ as long as the divisions: corolla rotate-campanulate about twice as long as the calyx, with obcordate or obovate divisions, 4 mm. broad, white veined with blue, as long as the tube: appendages at base short, triangular, obtuse, adherent by one side with the free side pointing towards the filaments and overlapping: stamens with filaments inserted at the base of the corolla, about as long as the tube: anthers dark brown, ovate, pointed: ovary and lower part of style densely hispid, the latter branched above the middle: fruit immature.

This was collected by the writer near the foot of the new road from Clear Lake to Bartlett Springs, February 15, 1900.

The plants were young and grew to a height of 15 cm. with

erect, branching stems, inclined to be decumbent. Undoubtedly when it grows older the stems elongate and trail over the ground or are supported by the stems of other plants.

18. **Nemophila divaricata** sp. nov.

Stems slender, divaricately forking, weak, retrorsely hispid with white hairs, ribbed, erect or decumbent, becoming 2 dm. or more in height: internodes longer than the leaves, 1–10 cm.: leaves opposite, oblong to ovate in outline, 1–3 cm. long, 5 mm.–1.5 cm. wide, divisions 5–7, the 3 upper generally confluent, the lower petiolulate, ovate-orbicular, entire or lobed: petiole about as long as the blade, hispid-ciliate, broadening towards the connate-clasping base: pubescence hispid with appressed hairs on both surfaces, veining not evident on upper surface, faint on lower: divisions of the calyx triangular-ovate or subulate, about 1 mm. long, glabrous on the inner surface, hispid on the outer and on the margin: the appendages very small, 1–3 mm., strongly deflexed: corolla rotate-campanulate, 7.5 mm. long with tube as long as the divisions, white, tinged with blue, hairy on the outside: divisions retuse or emarginate at apex, 4 mm. wide: appendages attached by the side next the stamens, folding towards each other, the free side ciliate or fringed, 2 mm. long: stamens with filaments a little longer than the tube inserted at its base: anthers oblong: ovary hispid to the base with white hairs: style divided half way, in fruit much surpassing the calyx: fruit not seen.

This was collected on Mount St. Helena by the writer, April 21, 1900, also by Mr. Brandegee in 1889. The figures show some variation between the plants of the two collections: but in all essential points they are alike. This is nearest to *N. hispida* from which it differs in having larger flowers and the appendages on the corolla differently attached. These two may be geographical varieties of the same species: but it seems better for the present to leave them as distinct species.

19. **Nemophila tenera** sp. nov.

Stems divaricately branching from the base and dichotomously above, 1–2 dm. high: branches slender, hispid with fine retrorse bristles which are minutely pustulate at base, ribbed: internodes more than twice as long as the leaves, 1–5 cm: leaves except near the top of the stem opposite, oblong-ovate in outline, .5–2 cm. long, 5–10 mm. broad, 5–7-lobed with the divisions confluent at apex, orbicular mucronulate, elliptical, entire, lobed or toothed

below, almost petiolulate: petiole broad, equalling or shorter than the blade, ciliate-hispid especially at the dilated base: peduncles slender, spreading, with the flower and fruiting calyx nodding, generally surpassing the leaves, hispid with retrorsely spreading bristles: calyx with the divisions linear-oblong, appressed hairy on the inner surface, hispid on the outer: auricles small, scarcely evident: corolla rotate-campanulate, 5 mm. long, with the broad obcordate or retuse divisions longer than the tube: appendages at base triangular, attached by one side, the upper free side toothed, the other towards the stamens entire: stamens inserted a little above the base of the corolla with filaments a little longer than the tube: ovary densely hispid: style apparently divided only near the top, shorter than the calyx divisions: capsule and seeds not known.

This appears to be found along the western base of the Sierra Nevada in Placer and Amador Counties. Specimens were examined from Applegate, Placer County, collected by Mrs. Helen Smith, May, 1899; from Folsom collected by Mr. T. S. Brandegee, April, 1883; and from Drytown, Amador County, collected by George Hansen, April 8, 1896 (no. 2064).

20. **Nemophila gracilis** sp. nov.

Stems very slender, branching from near the base and dichotomously and tritomously above, ribbed, sparingly hispid with retrorse hairs: internodes, except near the ends of the branchlets, 4–6 cm. long: leaves opposite, generally unequally lobed with 1–2 divisions on one side, 2–3 on the other, rarely 1 or 2 on each side, all broadly petiolulate, oblong-elliptical: margin sinuate, apex obtuse or mucronulate: upper surface bright green with sparingly appressed, stiff hairs which have black pustules at base, the lower paler and soft hairy, veining evident, texture thin: petioles somewhat shorter than the blades, narrower that the rachis, dilated and connate-clasping at base: flowers very small on capillary, hispid peduncles, 10–15 mm. long: calyx with linear-oblong divisions, thin and somewhat veiny, 1–2 mm. long, sparingly hispid on both surfaces, bristles on the margin long and unequal: auricles less than ¼ as long as the sepals: corolla rotate-campanulate, 3 mm. long: divisions as long as the tube, obovate-oblong, glabrous on inner surface, hairy on the outer: appendages narrow, glabrous, triangular, attached next the filaments by the longest side, the opposite angle free: stamens with slender filaments a little longer than the tube of the corolla attached at the base: anthers oblong, small: ovary and lower part of style densely hispid, divisions of

the style not extending to the middle : seeds large, more than 1 mm. in diameter, obscurely pitted and covered with scattered scales that are soon deciduous : calyptra not seen : on the specimens examined there was only one capsule, so that this description of the seed is not comprehensive enough to have much value.

This species was collected near Fresno by P. H. Buckminster in 1888.

21. **Nemophila nemorensis** sp. nov.

Stems branching from the base and dichotomously above, becoming more than 3 dm. long, decumbent or ascending, supported by other plants, weak, sparingly hispid with retrorse bristles, strongly ribbed ; lower internodes about 8 cm., upper becoming much shorter : leaves opposite or alternate, at the ends of the branches, upper ones frequently oblong, entire, on short petioles ; lower compound, with the top division 3-lobed, cuneate, the 4 or 6 lower ones orbicular on petiolules equalling or twice their length, often the lower leaflets are lobed : petioles hispid-ciliate at the dilated bases ; pubescence of stiff hairs upwardly appressed : peduncles slender, spreading, with the fruit generally nodding, 2–4 cm, long : divisions of the calyx linear-lanceolate, 2.5 mm. long, hispid externally, glabrous within : appendages very short, deflexed, darker green than the divisions : corolla rotate-campanulate, white, 6 mm. long, the divisions a little longer than the tube, obovate, retuse, hairy externally ; appendages triangular, attached by the long side, the opposite angle free and glabrous : stamens as long as the tube of the corolla, inserted a little above the base : anthers oblong, cordate : ovary very hispid : style divided half way : pod globular, hispid, papillose, surpassing the calyx : seeds 2–3, scrobiculate with cap-like calyptra, easily detached.

This pretty *Nemophila*, distinguished by the delicacy of its foliage, grows in shady places under brush and trees, and is found around San Francisco Bay. It varies extremely in foliage and slightly in the floral organs. The following specimens have been examined : two specimens from South San Francisco collected by Mrs. Brandegee, April, 1890 and 1892 ; four from Sutro's Hill, San Francisco, collected by the writer, April, 1894 ; four from Fairfax, Marin County, collected by the writer on several occasions, in the months of April and May ; one from Angel Island collected by E. L. Greene, April, 1886 ; one from Lagunitas Lake, one from Lagunitas Creek, and one from Mount Tamalpais collected by the writer in March and April, 1896, 1898 ; one

from San Rafael, collector unknown, collected April 18; three from Fruitvale, Alameda County, from Mrs. R. L. Toplitz, March, 1895.

22. **Nemophila glauca** sp. nov.

Stems branching from the base and above with spreading branches, rather stout, 2 mm. in diameter, pale glaucous, hispid with appressed hairs, somewhat angled: internodes on the lower stems longer than the leaves, on the upper shorter, 1–5 cm. long: leaves opposite: lower leaves with the apical division 2–3-lobed or entire, the 4 lower suborbicular, petiolulate, oval in outline, 1–2 cm. long, 1–1.5 cm. wide; upper leaves less divided and with divisions more approximate, almost sessile: petioles on the lower leaves as long as the blade, connate-clasping at the base: the upper leaves and flowers form clusters at the ends of the branches, the internodes probably elongating later: flowers from the lowest axils of the branches, on long, slender, erect or horizontally spreading peduncles which are as long as or shorter than the leaves: calyx with triangular-subulate divisions, hairy on both surfaces, with linear auricles half as long as the sepals: corolla white, rotate-campanulate, 5 mm. long, with broad obovate divisions nearly 4 mm. wide and hairy on the outside: appendages attached by one side, the freed edge somewhat laciniate: stamens with the filaments inserted on the base of the corolla, longer than the tube: ovary hairy above the middle, ovoid: style divided half way with spreading lobes: capsule not ripe.

This was collected by Mrs. C. C. Bruce on Big Chico, Butte County, May, 1897 (no. 2037).

23. **Nemophila fallax** sp. nov.

Widely spreading from the base and dichotomously branching above with erect or spreading branches, glaucous, hispid with fine, retrorsely spreading bristles, ribbed; lower internodes about twice as long as the leaves, about 6 cm: lower leaves ovate in outline, with 5–7 divisions: these petiolulate, orbicular, entire or 2–3-lobed; upper leaves much smaller, 2–3-lobed, aggregated with the flowers at the ends of the branches: petioles equal or shorter than the blades, hispid ciliate, dilated and clasping at base: flowers white, on slender axillary peduncles from almost the lowest axils: peduncles shorter than the leaves, at first erect, later spreading with the flowers nodding: sepals thin, veiny, hispid on both surfaces, lanceolate, 3 mm. long: auricles ovate, 1 mm. long, deflexed spreading: corolla rotate-campanulate, with the divisions twice as long as the tube, together about 5 mm. long, hairy

on the outside, of thin texture, no hairs or appendages at base; divisions retuse or emarginate at apex, 3 mm. wide: stamens with filaments longer than the tube of the corolla inserted at the base: ovary globular with the style branches surpassing the calyx forked half way down: fruit not seen.

This is similar in general appearance to *N. glauca* with which it was included by the collector. The pubescence is more spreading, the branching is more open, the leaves thinner and more openly divided while as can be seen in the figures the flowers are quite different in the shape and size of calyx and corolla which are also much thinner in texture; and lastly the corolla is without any hairs or appendages in the throat or at the base.

It was collected by Mrs. C. C. Bruce on Big Chico Creek, May, 1897. It is part of her no. 2037.

24. **Nemophila exigua** sp. nov.

Stems simple or branching from the base, slender, erect, almost glabrous; internodes 2–3 times as long as the leaves, about 3 cm.: leaves opposite, about 1 cm. long, broadly oblong to orbicular in outline, simply 5–7-lobed with the lobes generally opposite regular, entire and mucronulate, hispid with appressed hairs, petiole from almost none to slightly longer than the blade, broad, dilated and clasping at base: peduncles rather stout, spreading with the fruiting calyx nodding: calyx with triangular-subulate divisions, 2 mm. long, glabrous except near the bristly-ciliate margin: auricles linear, more than half as long as the divisions: corolla white, dotted with violet, rotate-campanulate, 3 mm. long, with divisions as long as the tube, somewhat hairy on the outside; appendages at base of 2 narrowly linear scales which are hairy on the free side: stamens a little longer than the tube of the corolla, inserted at its base; anthers cordate: ovary hispid, ovate: style divided above the middle, shorter than the calyx: pod purple, orbicular, 1–2-seeded: seeds orbicular, covered with scattered scales, irregularly pitted with the calyptra, stipe-like.

This was collected by George Hansen, at Stony Creek, Amador County, March 26, 1896 (no. 1522).

25. **Nemophila pulchella** sp. nov.

Stems widely branching from the base and above, slender, weak, decumbent or supported by other plants, becoming 3 dm. long, cinereous with retrorsely spreading, stiff, white hairs, ribbed with the ribs on the lower part becoming winged; longest inter-

nodes 10 cm.; lower leaves opposite, upper alternate, ovate in outline, 1–4 cm. long, divisions usually 5, the upper 3-lobed with orbicular mucronate divisions, the lower distant, petiolulate, 3-lobed; upper leaves with the lobes more approximate, and with shorter petioles: peduncles long, capillary, spreading or reflexed, half as long as the long internodes, longer than the upper, shorter ones: calyx with linear divisions extending almost to the base, veiny, hispid externally, sparingly hairy within, 2 mm. long, less than 1 mm. wide: auricles button-like or even wanting: corolla rotate-campanulate, blue or rarely white, 6–8 mm. across; divisions obovate-oblong, hairy on the outside in lines, glabrous within; appendages of two narrow, linear scales inserted between the stamens by one side, the free side ciliate on the margin: stamens with filaments longer than the tube of the corolla, inserted at the base: anthers oblong: ovary and lower part of style densely hispid: style forked almost half way: seeds 2–4, corrugated, with cap-like calyptra.

This beautiful little *Nemophila* is distributed through the lower mountains of the southern Sierra Nevada. Specimens have been examined from Sequoia Mills, Fresno County, from Kaweah in several distinct localities and with several specimens showing variation in foliage, habit and size of flowers. These were all collected by the writer. They grew in the shade of brush. Besides there are three specimens collected by Dr. G. Eisen in the foothills of the Sierra, probably from the same region, and three from C. A. Purpus collected in the Chaparrau belt, in the brush, Bear Creek, Tulare County, altitude 3000–5000 ft. (no. 1720). It flowers in April and May.

26. **Nemophila alata** sp. nov.

Stems several from the base, simple or branching above, erect but weak, apparently succulent, glabrous, sometimes spotted with purple, flat with wings broader than the axis, together 2 mm. wide: internodes about as long as the leaves, generally shorter than the peduncles, varying from 2–5 cm.: leaves almost regularly 5–7 pinnately parted, veiny, sparingly pubescent with hairs scattered or chiefly on the veins: divisions oblong, mucronate, the upper three somewhat confluent, the lower almost falcately spreading: petioles equalling or shorter than the blades, 2–4 mm. wide, dilated at the connate-clasping base which is sparingly ciliate: flowers from all the axils, on glabrous, winged, horizontally spreading peduncles which are about 4 cm. long: divisions of the calyx linear-subulate, 3 mm. long in flower, veiny, hispid on the

outer surface, glabrous on the inner, ciliate: auricles becoming almost as long as the divisions, strongly declined and hispid: corolla rotate-campanulate, 5.5 mm. long: divisions longer than the tube, obovate, emarginate, 3 mm. broad, with two rows of hairs between the filaments at base: stamens with filaments as long as the corolla tube and cordate-acuminate anthers: ovary hispid at summit and at the base of the style: style divided half way to the base, stigmas capitate: capsule orbicular, or ovate, margined, apparently flattened, glabrate, veiny under the lens, 5–6 mm. in diameter: seeds about 4, oblong, obscurely pitted: calyptra prominent and scrobiculate.

This well-marked species was collected by H. E. Brown, near Clear Creek, Butte County, California, March 3–22, 1897, being no. 173 of his collection.

27. **Nemophila rotata** sp. nov.

Stems one or several from the root, decumbent or ascending, about .12 cm. long, rather slender, angled, hispid with stiff, fine, spreading bristles, internodes longer or shorter than the leaves, from .5–3 cm.: leaves opposite, oblong in outline, 3–7-lobed, 5 mm. to 2 cm. long, 2 mm.–12 mm. wide, tapering at base to a broad margined petiole as long as the blade and dilated, connate-clasping at base, forming prominent nodes when the stems grow old, bristly-ciliate, especially near the base: divisions suborbicular, entire or more rarely lobed or toothed, mucronate: rachis as wide or slightly wider than the petiole; surface with the veins distinct, paler on the lower than the upper surface, the appressed hairs spreading: flowers from the lowest axils, soon deflexed on elongating, somewhat tortuous peduncles, which are densely hispid with horizontally spreading bristles and in length generally exceed the internodes: calyx with the divisions almost to the base, triangular subulate, 2 mm. long, hispid on both surfaces, near the apex on the inner: auricles linear, spreading, somewhat elongating in fruit: corolla bright blue, rotate, 9 mm. in diameter: divisions ovate-oblong, obtuse or acute at apex, extending almost to the base: basal scales, linear, hairy, attached by the base on each side of a filament: filaments and anthers violet, the former more than half as long as the petals, the latter heart-shaped: style divided almost to the base, ovary densely hispid: seeds 4–8, minutely scrobiculate and obscurely corrugated, the caruncle covered with a deciduous, stipe-like, curved calyptra.

This *Nemophila* was first collected by C. R. Orcutt in the Cantillas Mountains, Lower California (no. 1128), July 5, 1889. On

February 28, 1891, it was collected by the writer near San Diego.

It is easily distinguished from all the other species by the distinctly rotate corolla. It has apparently the same habit of burying its seeds in the ground that is shared by *N. sepulta* Parish and *N. humifusa* Kellogg.

Explanation of Plates 15-20

In these plates the figures of the dissected flowers are enlarged five times; the leaves are the natural size.

PLATE 15

FIG. 1. *Nemophila humifusa* Kellogg. Lake Merced, a, b, c; Mount Diablo, d, e, f; Cuyama, g, h, i.

FIG. 2. *Nemophila sepulta* Parish. a, b, c.

FIG. 3. *Nemophila quercifolia* Eastwood. a, b, c.

FIG. 4. *Nemophila Austinae* Eastwood. a, b, c.

FIG. 5. *Nemophila macrophylla* Eastwood. a b, c, d.

FIG. 6. *Nemophila inconspicua* Eastwood. a, b, c, d.

PLATE 16

FIG. 7. *Nemophila pustulata* Eastwood. a, b, c.

FIG. 8. *Nemophila micrantha* Eastwood. Lagunitas Lake, a, b, c, d; Mill Valley, e, f, g; near Mendocino City, h, i, j.

FIG. 9. *Nemophila Kelloggii* Eastwood. a, b, c, d, e.

FIG. 10. *Nemophila Plaskettii* Eastwood. a, b, c.

PLATE 17

FIG. 11. *Nemophila exilis* Eastwood. a, b, c, d, e.

FIG. 12. *Nemophila humilis* Eastwood. a, b, c, d.

FIG. 13. *Nemophila nana* Eastwood. a, b, c.

FIG. 14. *Nemophila Congdoni* Eastwood. a, b, c, d.

PLATE 18

FIG. 17. *Nemophila hispida* Eastwood. a, b, c.

FIG. 18. *Nemophila divaricata* Eastwood. Author's collection a, b, c, d; collection of T. S. Brandegee, e. f, g.

FIG. 19. *Nemophila tenera* Eastwood. a, b, c, d, e.

FIG. 20. *Nemophila gracilis* Eastwood. a, b, c.

PLATE 19

FIG. 21. *Nemophila nemorensis* Eastwood. a, b, c, d.

FIG. 22. *Nemophila glauca* Eastwood. a, b, c.

FIG. 23. *Nemophila fallax* Eastwood. a, b, c.

FIG. 24. *Nemophila exigua* Eastwood. a, b, c, d.

FIG. 25. *Nemophila pulchella* Eastwood. a, b, c, d, e.

PLATE 20

FIG. 15. *Nemophila flaccida* Eastwood. a, b, c, d, e, f.

FIG. 16. *Nemophila inaequalis* Eastwood. a, b, c, d, e.

FIG. 26. *Nemophila alata* Eastwood. a, b, c.

FIG. 27. *Nemophila rotata* Eastwood. a, b, c, d.

Riccia Beyrichiana and Riccia dictyospora

By Marshall A. Howe

In the course of some remarks at the meeting of the Torrey Botanical Club held on December 11, 1900, the writer made allusion to the probable rediscovery at Athens, Georgia, by Mr. R. M. Harper, of *Riccia Beyrichiana*—a species which is alleged to have been discovered in this country about seventy years ago by Herr Beyrich and has of late been a subject of considerable doubt inasmuch as nothing apparently like it had been met with since. It was our intention, as expressed to some at the time, to secure, if possible, a portion of Beyrich's original plant before publishing any notes on Mr. Harper's specimens, in order that the determination might not rest upon description alone. In the original description nothing at all is said of the spores, from which, in this genus, important specific characters are now drawn. Three years ago, Herr Franz Stephani gave a new diagnosis of the species, including an account of the spores, but this description was in a few respects somewhat out of harmony with Mr. Harper's plants and increased the desire on our part to see the specimens of Beyrich's own collecting. A loan of the desired original from the Lindenberg herbarium, now preserved in the Naturhistorisches Hofmuseum at Vienna, has recently been obtained through the courtesy of Dr. A. Zahlbruckner. And a careful comparison of Beyrich's plant with that of Mr. Harper has led to the unexpected conviction that the two plants are absolutely distinct from each other.

Some further reference to the brief history of *Riccia Beyrichiana* may be of interest at this point. The species was originally described in Lehmann's "Novarum et minus cognitarum Stirpium Pugillus Septimus," published in Hamburg in 1838. Like several other parts of this work, the seventh Pugillus contains the diagnoses of numerous new Hepaticae, diagnoses which are commonly ascribed to the joint authorship of Lehmann and Lindenberg though it is occasionally suspected that Lindenberg

was chiefly responsible for them. The fact that Lindenberg had already, only two years before, published his classical "Monographie der Riccien" makes it very probable that this *Riccia*, at least, would have received his special attention. *Riccia Beyrichiana* was, however, a MS. name of Hampe's under which, as it would seem, Hampe had communicated the plant to one or the other of the authors of the work. It is stated in connection with the first description that the plant was collected by C. Beyrich in North America, between Jefferson and Gainesville, there being no intimation as to what part of North America these two towns might be found in. But from what is known of Beyrich's travels and of American geography, it is evident that the Jefferson and Gainesville in question are in northern Georgia, where these two towns are county-seats, lying fifteen or twenty miles apart. Jefferson, by the way, is, according to Mr. Harper, less than twenty miles from Athens, where the plant recently suspected to be *R. Beyrichiana* was collected. To return to our bibliographical sketch, an abridged description of the species, a few years after its publication, was included in the Synopsis Hepaticarum of Gottsche, Lindenberg, and Nees, and then, in 1856, an English abstract of this was given a place by Sullivant in the second edition of Gray's Manual. In some unaccountable way, Sullivant ascribed the plant to Tennessee. In Professor Underwood's "Descriptive Catalog of the North American Hepaticae," published in 1884, the species was treated much as by Sullivant, though with more reference to the original description. But in some critical notes on the American species of *Riccia* published by Professor Underwood in the Botanical Gazette in 1884, *Riccia Beyrichiana* was omitted on the ground that there was no recent evidence that it was a member of our flora.

In 1898, however, Herr Stephani, in his Species Hepaticarum, states that he has seen Beyrich's plant, that it was collected in Jefferson, North America, and that it is doubtless a good species. And he gives a new and somewhat detailed description of it. After an examination of the Lindenbergian material, we concur with Herr Stephani in the opinion that *Riccia Beyrichiana* is a valid species. The pocket in the Lindenberg herbarium is marked clearly "Int. Jefferson & Gainsville, 13/8 33. Beyrich. Mis.

Hampe 1837," and in view of the little attention which the collection of the *Ricciae* has as yet received in this country it seems to us that it is too early to suspect that everything in this connection is not just as it purports to be. Herr Stephani's description* leaves little to be desired outside of a more detailed account of the spores, which we have supplied below in course of comparison with Mr. Harper's plant. The specimens collected by Mr. Harper represent, we believe, a hitherto unrecognized species which we would characterize as follows:

Riccia dictyospora sp. nov.

Thallus simple or once dichotomous, forming irregularly gregarious patches, finally oblong or elongate-obovate, rarely sublinear, 4–10 mm. × 1–2 mm., reticulate above, light green (when dry) with at length a narrow dark-purple border; median sulcus acute and somewhat pronounced toward the apex; ventral scales entire, purple at maturity, slightly exceeding the thin submembranous ascending thallus-margins; width of transverse sections of the thallus 1.5–3 times their height, the ventral outline rounded-convex or somewhat flattened, air-canals narrow and vertical, special cells densely filled with a yellowish granular substance ("oil-body" cells) usually abundant: primary epidermal cells oval-papilliform, soon collapsing, leaving more or less persistent cup-like vestiges: monoicous: antheridial ostioles not elevated: spores brown, rather translucent, soon exposed by the rupture of the overlying parts, 95–116 μ in maximum diameter, scarcely angled, somewhat flattened, wholly destitute of wing-margins, almost uniformly areolate over entire surface, in optical section appearing densely beset on all sides with short truncate spines or papillae; areolae of the outer face 8–12 μ in width, often less perfect in the middle of the face; areolae of the inner faces so similar to those of the outer as not to be readily distinguished at first sight, yet slightly larger and less regular, with somewhat less elevated boundaries.

On moist granite rock near Oconee River, Athens, Georgia (alt. 183 m.), Roland M. Harper, June 26, 1900, no. 68a.

In *Riccia dictyospora* the markings of the spore-wall are developed over its entire surface with a rare uniformity, the areolae being carried over the rounded scarcely perceptible wingless angles with little interruption. That there is, however, a difference in the

* Bull. Herb. Boiss 6: 318. 1898.

development of the inner and outer faces becomes especially apparent when these faces are compared in profile. The spines or papillae of the outer face are then seen to be considerably longer, projecting 6–9 μ, while those of the inner faces project only 4 or 5 μ.

Riccia Beyrichiana, with which, on account of its dark purple lower surface and the geographical association, *Riccia dictyospora* is perhaps most likely to be confused, is a considerably smaller plant* with thick rounded-obtuse, or, at the thallus-apex, merely acute, margins, which occasionally bear short cilia. In *R. dictyospora*, on the other hand, the thallus-margins are thin and submembranous and no cilia have been seen. But more striking distinctive characters are to be found in the spores. In *Riccia Beyrichiana* the mature spores are so extremely opaque that very little can be made of their surface-markings until they have been well saturated with glycerine after having been soaked out in water. It is nevertheless seen at once that they are distinctly angular, though often flattened or irregular in form, and that they are very large, measuring 116–140 μ in maximum diameter. In glycerine it can be determined that the inner faces are almost absolutely smooth, being roughened only by very fine granulations or sometimes by a faint suggestion of areolae. The outer face bears areolae which are 15–20 μ in diameter—much larger than in *R. dictyospora*. The boundaries of these areolae are less elevated than in many species of *Riccia* and the outer face as a rule appears rather obscurely papillate, yet in profile view it sometimes exhibits papillae 4 or 5 μ in length. The seams or wings at the angles of the spore are often narrow and obscure, but they sometimes broaden here and there into expansions 6–8 μ in width. It is possible that the opacity of the spores of Beyrich's plant has slightly increased during the many years of preservation, but age can be in no way responsible for the

* None of the specimens that we have seen from the Lindenberg herbarium is more than 5 mm. long and when soaked out they measure only .6–.8 mm. in width, though it is probable that after nearly seventy years of drying they do not quite regain their former dimensions. In regard to length, however, it is to be noted that Lehmann and Lindenberg in the original diagnosis (Lehm. Pugill. 7: 1. 1838) describe the "fronds" as "2–4 lineares," while Stephani (*l. c.*) has recently described them as "usque 10 mm." The antheridia of *Riccia Beyrichiana* we have not seen, paucity of material standing in the way of extended search, so we are unable either to confirm or deny Stephani's statement that the species is monoicous.

other important characters which distinguish the spores of *Riccia Beyrichiana* from those of *R. dictyospora*. Age has not made the mature spores of *Riccia Beyrichiana* the more angular, it has not increased their size, it has not left more or less of a wing at their angles, it has not smoothed off their inner faces, and it has not doubled the diameter of the meshes of the outer face.

We do not know of any *Riccia* hitherto published which seems very closely allied to *R. dictyospora*. Among American species, *Riccia Americana* and *R. Austini* resemble it in the entire absence of wing-margins to the spores but in other respects have little in common with our plant.

Riccia Beyrichiana apparently remains a species unknown except from the original collection of August 13, 1833. It is to be hoped that botanists resident in the Southern States and those traveling in that region will consider its rediscovery a problem worthy of their attention.

COLUMBIA UNIVERSITY, 11 February, 1901.

The Genus Teucrium in the Eastern United States

By Eugene P. Bicknell

Here and there along the shores of the Hudson near New York, grows a germander with palest pink flowers. The plant has long been familiar to me and, in accordance with established usage, I have always known it as the *Teucrium Canadense* of Linnaeus—the single species of the genus credited generally to the eastern states.

In Maine, some years ago, the same plant was found growing in abundance on stony shores back of the beaches both along the ocean and about the mouth of the York River. Here, however, there occurred with it at several places a somewhat stouter plant having rose-purple flowers which, although greatly resembling the other was obviously not the same.

An added interest came into the matter when, upon the occasion of a joint field meeting of the Philadelphia and New York botanical societies in Bucks County, Pennsylvania, on July 4, 1899, a germander just in flower along the shores of the Delaware River was readily seen to be different from the two which had been previously met with; and even more interesting was the receipt of specimens collected on the shores of Lake Champlain by Mr. W. W. Eggleston which again it was impossible to correlate satisfactorily with anything before seen.

An examination of the herbaria of the New York Botanical Garden and Columbia University showed that the mass of eastern specimens could be readily sorted into two series, one representing a coastwise plant, that of the Hudson River—the other being the plant of the Delaware and showing it to be our commonest and most generally distributed species. In these considerable collections the brighter-flowered Maine plant was quite unrepresented and the Champlain plant only by a few examples mostly from the same localities from which I had already received it. In addition two specimens from Michigan possessing characters not shared by any of the others were especially noteworthy, as well as a typical ex-

ample of *T. occidentale* Gray from as far east as Lake Ontario. A detailed study of the whole subject gave the very unexpected result that six species instead of two are to be credited to our eastern flora.

In these circumstances it becomes necessary before pursuing the subject further to inquire into the exact significance of the Linnaean names *T. Canadense* and *T. Virginicum*, both applied to plants of the Eastern United States. In Species Plantarum we find that the former species was based primarily on the *Chamaedrys Canadensis* of Tournefort and that under it a specimen of Gronovius' is also cited, but with a mark of doubt. The *T. Virginicum* was based alone on a Gronovian species.

When in London three years ago, Professor Underwood kindly undertook to look into the matter of the Linnaean types. The specimen underlying *T. Virginicum* was searched for with the assistance of Mr. Britten both in the British Museum and at the Linnaean Society rooms; it was not to be found and is probably not now in existence.

The specimen doubtfully cited by Linnaeus under his *T. Canadense* was, however, brought to light at the British Museum. It proved to be "wholly unsatisfactory" and was regarded both by Mr. Britten and Professor Underwood as a pathological plant. However, from the careful notes and sketches of the leaves made by Professor Underwood I have little doubt that the specimen is actually our common coastwise plant. On the other hand Tournefort's description of his *Chamaedrys Canadensis*, the actual type of the Linnaean species, although unsatisfactory, points with reasonable certainty to our common inland species; his words "*urtice folio subtus incano*" apply with ready appropriateness to this plant while scarcely to be suggested by the narrow-leaved coast form. The name *T. Canadense*, therefore, while not wholly free from uncertainty now that six species present themselves, may fairly be retained for our more inland plant, and fortunately so since this species being the most widely distributed and commonest of all may be accepted as the one for which the name has been more especially used.

As to *T. Virginicum* of Linnaeus the evidence deducible from the words of Gronovius, all that remains to us, allows scarcely a

doubt that it was nothing else than the *Chamaedrys Canadense* of Tournefort and that therefore the name *T. Virginicum* L. has quite properly been considered a synonym of *T. Canadense* L. At the same time it is fairly clear that Gronovius recognized both of our most common species, a discrimination of nearly two hundred years ago which has remained unverified to the present day.

But a further interest attaches to Linnaeus' treatment of his *T. Canadense*. In his remarks touching it he refers descriptively to a plant from "Canada" and also to one which he had in cultivation. The latter, again, can scarcely be other than his *T. Virginicum*, but the former by the clearest indications of probability was the Lake Champlain species of which I have spoken and which is perfectly distinct from the species with which Linnaeus associated it. Therefore of the six species now to be recognized it appears that two only have ever received distinctive names.

TEUCRIUM CANADENSE L. Common Germander

Erect, from .5 to over 1 dm. high, simple or above with several flowering spikes: stem and inflorescence closely canescent-pubescent: leaves rather thin, ovate to ovate-oblong or narrower, rounded or rarely subcordate at base, acute or acuminate at apex, 6–14 cm. long, 2.5–5 cm. wide, closely and often irregularly dentate-serrate, above green and thinly appressed-hirsutulous to glabrate, hoary-pubescent beneath, the canescent petioles 5–12 mm. long or shorter on the upper leaves: calyx often purplish, canescent, 5–7 mm. long, turbinate, the upper teeth acute or obtuse, the lower pair slightly longer, triangular-subulate: bracts mostly not surpassing the mature calyx: spikes dense: corolla pink, 15–20 mm. long, the outer surface minutely glandular-puberulent.

Western New England to Georgia and southern Texas, west to Arkansas. Low grounds and river shores, June–July.

NEW YORK: ex Herb. Torrey; Head of Seneca Lake, Gray.

PENNSYLVANIA: Point Pleasant, E. P. B.; Nockamixon Rocks, H. H. Rusby; Sayre, W. C. Barbour; Easton, A. A. Tyler.

OHIO: Columbus, N. L. Britton.

WEST VIRGINIA: Ripley, C. F. Millspaugh; Bayard, C. F. M.

NORTH CAROLINA: Biltmore.

SOUTH CAROLINA: Pickens County.

GEORGIA: Macon, J. K. Small.

TENNESSEE: Henderson, S. M. Bain; Knoxville, A. Ruth.

KENTUCKY: C. W. Short, M.D.; Lexington, R. Peter.

MISSOURI: Watson, B. F. Bush.

ARKANSAS: Dr. Pitcher.

KANSAS: Ft. Riley, E. E. Gayle, J. B. Norton.

INDIAN TERRITORY: Dr. Edward Palmer.

TEXAS: Kerryville, A. A. Heller.

MEXICO: Sonora, Geo. Thurber, no. 698, probably var. *angustifolium* Gray.

ARIZONA: Tucson, C. G. Pringle, probably var. *angustifolium* Gray.

NEBRASKA: Mead, P. A. Rydberg.

IOWA: Debora, E. W. D. Holway.

WISCONSIN: Milwaukee, Dr. H. E. Hasse.

Teucrium littorale sp. nov. Coast Germander

Pale and canescent, 30–50 cm. high, erect or assurgent, often with ascending branches: leaves thickish and rugose-veiny, narrowly oblong or sometimes broader, narrowed into the petiole, acute or obtusely pointed, closely fine-serrate or becoming unequally somewhat dentate-serrate, 6–11 cm. long, 1.5–4 cm. wide, when dry the upper surface minutely papillose-roughened beneath the soft appressed pubescence; petioles 5–10 mm. long: spikes narrow, often interrupted; bracts about the length of the calyx: calyx small, 4–5 mm. high, becoming somewhat gibbous-urceolate, the teeth short, the upper ones obtuse: corolla pale pink, about 15 mm. long, loosely pilose without.

On or near the coast, Maine to Florida, July–August.

MAINE: York Harbor, Aug. 26, 1896, E. P. B. Type, in Herb. N. Y. Bot. Gard.

MASSACHUSETTS: Nantucket, E. P. B.

NEW YORK: Ft. Washington, E. P. B; Long Island, ex Herb. Torrey, Sag Harbor, N. L. Britton.

MARYLAND: Stocton, H. H. Rusby.

VIRGINIA: Norfolk, N. L. Britton, A. A. Heller.

SOUTH CAROLINA: Charleston, L. R. Gibbes.

FLORIDA: Chapman; Duval Co., L. H. Lighthipe; Jacksonville, A. H. Curtiss.

Teucrium roseum sp. nov. Maine Germander

Rather stout and deep green, 30–70 cm. high, the stem soft pubescent or downwardly villous, often with ascending branches

above: leaves short-oblong or oblong-ovate, cuneate at base, acute or acuminate at apex, irregularly dentate-serrate or somewhat cut-serrate with numerous subspreading teeth, more or less densely hoary-tomentose beneath, softly pilose-pubescent above, 6–9 cm. long, 2.5–4.5 cm. wide, the slender petioles hoary-pubescent, 10–15 mm. long: inflorescence hoary-villose: calyx often purplish, 5–7 mm. long, the upper tooth acute, the lateral ones obtuse, the lower pair but little longer, triangular-subulate; pedicels very short: bracts usually longer than the calyx, ciliate-fringed: corolla rose-purple, somewhat smaller than in *T. littorale* and less exserted, more or less pilose-bearded.

Coast of Maine, August–September, York Harbor, Aug. 18, 1896, E. P. B. Type in Herb. N. Y. Bot. Gard. Mt. Desert, Aug. 19, 1897. E. P. B.

TEUCRIUM OCCIDENTALE Gray. Western Germander

From 30–80 cm. high, becoming erectly branched above, the dense narrow spikes either short or flexuously elongated: stem and petioles villous-hirsute with spreading or recurved hairs, the inflorescence densely hirsute and viscid-glandular; leaves ovate-oblong, narrower or broader, 4–9 cm. long, 1.5–3 cm. wide, mostly rounded at base, acute and sharp-serrate, papillose-hirsute above, tomentulose or hirsute-pubescent beneath with spreading hairs on the larger veins, petioles 10–20 mm. long: bracts mostly shorter than the calyx: calyx often purple, 5 mm. long to the acute upper teeth, the elongated lower teeth more or less stiffly lanceolate-subulate: corolla pinkish-purple, 8–12 mm. long, tomentulose and glandular without.

Ontario and Missouri to California and British Columbia, August.

ONTARIO: Kingston, J. Fowler.

NEW YORK: Manitou Beach, Lake Ontario, N. L. Britton.

OHIO: Riddell, 1834.

MISSOURI: Jackson Co., B. F. Bush.

NEBRASKA: P. A. Rydberg.

IOWA: Armstrong, R. I. Cratty; Ames, L. H. Pammel and C. R. Ball.

COLORADO: Canyon City, Miss Alice Eastwood.

ARIZONA: Fort Apachee, Mrs. R. W. Hoyt.

CALIFORNIA: Valley of the Sacramento, Wilkes Expedition, no. 1331.

BRITISH COLUMBIA: John Macoun.

Teucrium boreale sp. nov. Northern Germander

Erect or ascending, rather slender, often widely branched from the base, from 30 to 80 cm. or more tall: stem loosely pubescent with recurved hairs, especially on the angles, to glabrate, the inflorescence somewhat villous-pubescent, scarcely if at all glandular: spikes rather short or the terminal one elongated, often interrupted and somewhat flexuous: leaves thin or membranous, ovate-oblong to oblong-lanceolate, sometimes narrowly so, 5–10 cm. long, 2–3.5 cm. wide, acute at the apex, rounded or narrowed at the base, more or less regularly sharp-serrate to dentate-serrate, above minutely hispidulous puberulent, beneath thinly tomentulose, or sometimes glabrate throughout: petioles of the main leaves becoming 10–20 mm. long: bracts mostly shorter than the calyx, ciliate: calyx thin, campanulate, 4–5 mm. long, the subequal teeth short and broad, the lateral pair very obtuse: corolla purplish-pink, 12–15 mm. long, about three times the length of the calyx, loosely short-pubescent and dotted with minute glands, the terminal lobe broad.

New Hampshire to northern New York, August.

NEW HAMPSHIRE: Lyme, W. W. Eggleston.

VERMONT: Alburg Springs and Rutland, W. W. Eggleston; Burlington, Grant.

NEW YORK: West Point, ex-Herb. Torrey; Westminster Park, Miss E. Babcock. Type from Vermont, in Herb. N. Y Bot. Garden.

Teucrium menthifolium sp. nov. Mint-leaved Germander

Sparsely hirsute-pubescent with recurved hairs to nearly glabrous except the inflorescence, smaller and less branched than *T. occidentale*, the denser spikes shorter, with the bracts often conspicuously elongated and foliaceous, the pubescence not viscid nor glandular: leaves firm and thickish, pale green, minutely pubescent to glabrate above, white-veiny and thinly tomentulose beneath, with longer hairs on the veins or glabrate, lanceolate or narrowly oblong, narrowed or contracted at the base, 5–9 cm. long, 2–3 cm. wide, acute or acuminate at the apex, somewhat regularly sharp-serrate: calyx 5–6 mm. long, narrowly campanulate, the teeth shorter and less rigid than in *T. occidentale*, the lateral obtuse, the lower pair only slightly longer: corolla pink, short, sometimes not twice the length of the calyx, thinly pubescent and glandular, the terminal lobe small, often not broader than the lateral ones.

CENTRAL MICHIGAN: Alma, July 17, 1890, August, 1892. Charles A. Davis. Type in Herb. Columbia.

Synopsis of the Species

Pubescence of stem more or less closely hoary.

Canescently short-pubescent: leaves ovate-oblong, rounded at base, the upper surface thinly hispidulous to glabrate: corolla pink, minutely glandular-puberulent. 1. *T. Canadense.*

Downy-canescent: leaves narrowly oblong or broader, the base narrowed, the upper surface soft-pubescent: corolla pale pink, loosely pilose. 2. *T. littorale.*

Soft-pubescent or downwardly villose: leaves oblong-ovate, cuneate at base, pubescent above: corolla rose-purple, pilose-bearded. 3. *T. roseum.*

Pubescence looser, of longer spreading or recurved-spreading hairs.

Pubescence usually dense and spreading, the inflorescence hirsute and glandular-viscid. 4. *T. occidentale.*

Pubescence shorter and sparser, the inflorescence not glandular-viscid or scarcely so.

Leaves thin, bracts short: corolla about three times the length of the calyx. 5. *T. boreale.*

Leaves firm, bracts often elongated: corolla about twice the length of the calyx. 6. *T. menthifolium.*

Further Studies on the Potentilleae

By P. A. Rydberg

I. WEST AMERICAN SPECIES

Potentilla horrida sp. nov.

A stout perennial with very thick woody root and a short caudex covered with the thick coriacious brown remains of old leaves: stems ascending, 1.5–4 dm. high, stout, few-leaved, hirsute-villous: petioles of the basal leaves 5–10 cm. long, stout, densely hirsute-villous, broadened at the base and surrounding the stem: leaves digitate; leaflets usually 5, linear-oblong or oblong-lanceolate, obtuse, crenulate, 3–5 cm. long, 7–12 mm. wide, densely pubescent on both sides, almost velvety: pubescence at first white, later on brown, consisting of tomentum and longer silky hairs: stem-leaves similar or trifoliolate, much smaller; the upper subsessile; the stipulates lanceolate to linear-subulate, 1–3 cm. long, adnate to the petioles: cyme rather congested: hypanthium and calyx densely pilose: bractlets lanceolate, acute, about half as long as the ovate-lanceolate sepals which are about 5 mm. long: petals yellow, broadly obovate, about 7 mm. long.

A species of the *gracilis* group, but resembling most *P. Haematochrus* in habit and pubescence. It differs, however in the coarser pubescence, the 5-foliolate, instead of 7-foliolate leaves and the yellow petals. The type specimens were found at an altitude of 2250 m.

Mexico, State of Chihuahua: Sierra Madre, near Colonia Garcia, 1899, *Townsend & Barber, 16.*

Potentilla brunnescens sp. nov.

A tall strict perennial with short scaly rootstock: stem 4–5 dm. high, pubescence, especially above, tinged with brown or purplish: basal leaves digitately 5–7-foliolate; petioles often 2 dm. long, villous with spreading hairs; leaflets 4–7 cm. long, broadly oblanceolate in outline, brownish strigose on both sides, paler beneath, pectinately divided to near the midrib; segments linear, obtuse: stem-leaves similar but short-petioled or subsessile, smaller: cyme many-flowered, corymbiform: hypanthium and calyx villous-strigose: bractlets linear, obtuse, about half as long as the

ovate-lanceolate, acute sepals: petals yellow, 5–6 mm. long, obovate, about one fourth longer than the sepals.

The species is a member of the *gracilis* group and nearest related to *P. flabelliformis*, from which it differs in the light brown or yellowish pubescence and the lack of tomentum on the lower surface of the leaves. The type was collected at an altitude of nearly 2000 m.

WYOMING: Spread Creek, in the Teton Forest Reserve, 1897, *F. Tweedy, 212.*

Potentilla Townsendii sp. nov.

A slender perennial with a deep root and a short caudex, covered by the brown remains of old leaves: stem ascending, 3–5 mm. high, sparingly silky: petioles of the digitate basal leaves 7–10 mm. long, slightly hairy; stipules adnate to the petioles; the free portion linear-subulate; leaflets 5–7, oblanceolate to almost linear, serrate, acute, glabrous above, sparingly hairy beneath, principally on the veins: stem-leaves 2–3, similar, but with shorter petioles: stipule large, 3–4 cm. long, lanceolate or ovate-lanceolate: cyme rather open: hypanthium and calyx silky-strigose: bractlets linear-lanceolate, equalling the lanceolate sepals: petals yellow, broadly obcordate, about 1 cm. long and almost twice as long as the sepals.

This species is perhaps nearest related to *P. heptaphylla*, but easily distinguished by the narrow leaflets and the larger flowers. It was collected at an altitude of about 2250 m.

MEXICO, STATE OF CHIHUAHUA: Sierra Madre, near Colonia Garcia, July 17, 1899, *Townsend & Barber, 105.*

Potentilla filipes sp. nov.

A tall perennial with several stems from the short caudex. Stem 3–5 dm. high, slender, silky-hirsute, simple up to the inflorescence: few-leaved: basal leaves mostly 7-foliolate, digitate, with hirsute petioles, 5–15 cm. long; leaflets obovate to oblanceolate, obtuse, coarsely crenate, 2–6 cm. long, green and sparingly strigose above, white-tomentose beneath; stem-leaves similar, but smaller, usually 5-foliolate, short-petioled: stipules ovate-lanceolate, entire: cyme open: pedicels very slender, as well as the hypanthium and calyx silky hirsute and more or less viscid: bractlets linear-lanceolate, a little shorter than the lanceolate, acute sepals: petals yellow or somewhat orange, broadly obcordate or

obovate and emarginate, 6–8 mm. long, exceeding the sepals: stamens about 20.

This species is nearest related to *P. pulcherrima* Lehm., and I had referred all the specimens cited below, except the type, to that species. It differs from *P. pulcherrima* in the very slender pedicels, the total lack of tomentum on the hypanthium and the calyx and the evident viscidity of these organs and the pedicels. It grows in mountain meadows and on hillsides at an altitude of 2400–3200 m.

COLORADO: Wahatoya Cañon, Spanish Peaks, 1900, *Rydberg & Vreeland, 6039* (type); West Mancos Cañon, 1898, *Baker, Earle & Tracy, 306;* La Plata Mountains, *182.*

MONTANA: Bridger Mountains, 1896, *J. H. Flodman, 561.*

Potentilla permollis sp. nov.

A stout hoary perennial. Stems simple, about 6 dm. high, densely and softly pubescent with long whitish hairs: basal and lower stem-leaves usually 7-foliolate, digitate; petioles about 1 dm. long, pubescent: leaflets obovate to oblanceolate, obtuse, coarsely cleft nearly half way to the midrib, with lanceolate lobes, densely soft-pubescent on both sides, greenish above, white and somewhat tomentose beneath: upper stem-leaves 3–5-foliolate, similar, smaller, short-petioled: stipules of the stem-leaves large, adnate to the petiole, ovate, often over 3 cm. long: cyme rather open: hypanthium and calyx densely white-pubescent: bractlets linear-lanceolate, about equalling the lanceolate sepals: petals yellow, 6–7 mm. long, obcordate, exceeding the sepals by about one fourth: stamens about 20.

This species is nearest related to *P. Blaschkeana*; but differs principally in the denser and white pubescence and the smaller flowers. It grows in meadows.

WASHINGTON: Endicot, Whitman Co., 1898, *A. D. E. Elmer, 1830.*

Potentilla obovatifolia sp. nov.

A low perennial with a thick tap-root: stems ascending or depressed, 2–3-leaved, 1.5–2 dm. high, sparingly villous: basal leaves mostly digitately 7-foliolate with petioles 3–10 cm. long: leaflets broadly obovate, obtuse, coarsely crenate-serrate, green and sparingly hairy above, white tomentose beneath, .5–3 cm. long: stem leaves mostly 3-foliolate, small, short-petioled with broadly lanceolate stipules: cymes open but few-flowered: hypanthium and calyx densely silky: bractlets and sepals lanceolate, sub-

equal: petals obcordate, yellow, about 8 mm. long, nearly twice as long as the sepals.

This species is a member of the *concinna* group and nearest related to *P. concinniformis*; but is larger; the leaflets are greener and more glabrous above and the bractlets are longer. By the size it approaches the *gracilis* group.

MEXICO: *Pringle, 6890.*

Potentilla Hallii sp. nov.

A more or less villous-hirsute ascending or decumbent perennial with a short rootstock or caudex: stem about 3 dm. long, sparingly villous-hirsute, terete and light green: leaves mostly digitately 5-foliolate or the upper 3-foliolate or simple: basal ones with petioles 3–5 cm. long: leaflets obovate, 1–3 cm. long, coarsely serrate-crenate, green and slightly hairy above: paler, hirsute and sparingly tomentulose beneath: upper stipules ovate, entire, 12–15 mm. long: cyme rather open: hypanthium and calyx hirsute, more or less tinged with purple: bractlets ovate-lanceolate about one third shorter than the ovate acute sepals: petals yellow, about 5 mm. long, scarcely exceeding the sepals: stamens 20.

This species is nearest related to *P. fastigiata*, but is greener and with a more open cyme. As to the pubescence of the leaves, it resembles *P. viridescens;* but is in every respect smaller and the stem is not erect. On account of its small size, it could just as well be referred to the *maculata* group as to the graciles. The type grew at an altitude of about 1600 m.

CALIFORNIA: Pine Ridge, Fresno County, 1900, *Hall & Chandler, 182.*

Potentilla propinqua

Potentilla diffusa A. Gray, Mem. Am. Acad. 1849: 41. 1849. Not Willd.

P. Hippiana, var. *diffusa* Lehm. Ind. Sem. Hort. Bot. Hamb. 1849: 8.

P. Hippiana, var. *propinqua* Rydb. Bull. Torr. Club, **24**: 3. 1897.

The original specimens were rather depauperate and the most prominent characters which separate it from *P. Hippiana* were not noticed by me when I prepared my Monograph of the North American Potentilleae. The plant is much greener than *P. Hippiana*; the upper surface of the leaves, as well as the pedicels,

hypanthium and the calyx, is only slightly silky, not at all tomentose; the cyme in well-developed specimens is more open and flat-topped; and the upper segments of the leaves are decurrent and sometimes confluent, which is never the case in *P. Hippiana*. By the latter characters it approaches *P. ambigens* Greene. From this it differs in the appressed pubescence, the smaller flowers and the less coarsely toothed segments. Baker's no. 390, as represented in the herbarium of the New York Botanical Garden, was named *P. ambigens* by Professor Greene, but belongs unquestionably to this species.

Horkelia Chandleri sp. nov.

A low silky perennial with very thick and woody root and short cespitose caudex with erect branches densely covered by the remains of old leaves. Stems scapiform, slender, silky villous, 7–16 cm. high: basal leaves numerous, 4–5 cm. long, densely silky, terete, worm-like from the numerous small crowded segments: flowers about 4 mm. in diameter, rather many in subcapitate dense clusters, hypanthium cup-shaped, as well as the calyx densely villous: bractlets linear, about two thirds as long as the triangular-ovate sepals: petals yellow, linear, 1.5 mm. long, shorter than the sepals: stamens mostly 5: filaments subulate-filiform.

This species closely resembles *H. Muirii* in the leaves and the thick root and caudex: but differs in the taller scape, the more numerous flowers, the longer bractlets, and the narrower linear petals. The type grew at an altitude of about 3450 m.

CALIFORNIA: Mt. Goddard, 1900, *Hall & Chandler*, 700.

Drymocallis gracilis sp. nov.

A tall and slender, glandular pubescent perennial with a more or less cespitose caudex. Stem about 6 dm. high, glandular-pilose throughout, branched above: basal and lower stem-leaves pinnately 7–9-foliolate, 1–3 dm. long: leaflets obovate to flabelliform, 1–5 cm. long, coarsely incised, except at the bases, sparingly pubescent on both surfaces: upper stem-leaves 3–5-foliolate, subsessile: pedicels slender, .5–4 cm. long, very glandular: hypanthium and calyx glandular: bractlets linear, about half as long as the lanceolate acuminate sepals; these in fruit often 8 mm. long: petals white, small, broadly obovate, scarcely exceeding the sepals: stamens, 20–25: style slightly fusiform.

This species resembles most *D. glandulosa incisa* in habit and

leaf-form; but differs in the white petals, more acuminate sepals and the denser glandular pubescence. The type was collected at an altitude of about 1600 m.

CALIFORNIA: Pine Ridge, Fresno County, 1900, *Hall & Chandler, 138.*

II. SOME SPECIES FROM GREENLAND

Some time ago Mr. Morten Pedersen, Assistant at the Botanical Garden of Copenhagen, requested me to determine a collection of *Potentillae* collected by him in Greenland. He also kindly sent me several other specimens from the herbarium of the Botanical Museum of such forms that I had not seen at all or of which I had had only imperfect material. With the help of this material I have been able to settle several important points and considerably modify the disposition in my monograph.

POTENTILLA MACULATA Pourr. Act. Toloss. **3**: 316. 1788

The following specimens additional to those given in my monograph,* belong to this species:

GREENLAND: Kingua Tasiusok (61°45′), 1889; Scoresby Sund, 1891; Danmarks, Oe. 1892; Jameson's Land, 1891, *N. Hartz;* Godthaabs Fjord, 1883, *J. A. D. Jensen;* Alangua, 1885, *S. Hansen;* Umanaks Fjord, 1885, *P. Eberlin;* (locality not given), *Raben, 1;* Scoresby Sund, 1891, *H. Hartz;*† Kvan Valley, behind Ujaragsugsuk, 1898, *Morten Pedersen, 705;* Ekalunguit Itivnerit *429;* both on Disco.

POTENTILLA MACULATA var. FIRMA Lange, Consp. Fl. Groenl. 235 is scarcely that of Lehmann,‡ although it agrees perfectly with Lehmann's description. The latter was in reality based upon *P. alpestris α firma* Koch. I have no means to find what this really is; but Lehmann cites *P. alpestris c rubens* Hegetschw. and *P. rubens* Vill. as synonyms. These names represent a coarser plant from Austria, Switzerland and Italy with longer and more acutè teeth to the leaves. I think it is a good species distinct from

* Mem. Dep. Bot. Columbia Univ. **2**: 59.

† This sheet is labeled *Potentilla maculata* Pourr. var. *gelida* C. A. Mey., as it appears on the label from the fact that a few of the basal leaves are ternate, a condition not uncommon in *P. maculata*. It has nothing to do with *P. gelida* C. A. Meyer.

‡ Rev. Pot. 120.

P. maculata. The Greenland plant cited by Lange agrees fully with the typical *P. maculata* except that the leaflets are broader, more round and overlapping each other by the margins. I scarcely think that it deserves a varietal name. If it does it must bear some other name than *firma*, as this is preoccupied. The specimens cited by Lange and the only one seen is the following:

GREENLAND: Holsteinsborg, 1884, *Eug. Warming & Th. Holm.*

Potentilla Langeana sp. nov.

P. maculata β hirta Lange, Consp. Fl. Groenl. 6. 1880. Not *P. hirta* L.

A cespitose perennial. Stems erect or ascending, 2–3 dm. high, sparingly hirsute with erect branches: basal leaves digitately 5-foliolate: stipules large, adnate, lanceolate, 1–2 cm. long: petioles 3–8 cm. long, sparingly hirsute: leaflets cuneate-obovate, more or less densely silky-hirsute on both sides, 1–3 cm. long, coarsely toothed above the middle with oblong ovate teeth, the cuneate base entire: lower stem leaves similar but smaller and short-petioled: upper stem-leaves ternate or simple and subsessile: stipules ovate, acutish, about 1 cm. long: cyme 3–7-flowered; hypanthium silky hirsute: bractlets oblong to lanceolate, acute or obtuse, about one fourth shorter than the lanceolate sepals: petals broadly obcordate, 7–8 mm. long: stamens about 20.

The species differs from *P. maculata* not only in the characters given by Lange, the several-flowered cymes and the long pubescence of the leaves; but also in the more acute teeth, the longer and more acutish bractlets and narrower sepals. In *P. maculata* both the teeth of the leaves and the bractlets are rounded at the apex and the latter are only one half or two thirds as long as the sepals. *P. Langeana* is in reality nearer related to *P. verna* than to *P. maculata* but distinguished from that by the pubescence. In Conspectus Florae Groenlandicae several more specimens are cited belonging to *P. maculata β hirta* Lange. The following are the only ones seen by me:

GREENLAND: Amaralik Fjord, 1831, *J. Vahl* (type); Kangerdluarsuk Fjord, 1884, *Warming & Hohn;* Natsilik, *S. Hanson;* Ekalunguit Itivnerit on Disco, 1898, *Morten Pedersen, 419;* Ekigtok in Disco Fjord, *1684* (a taller and more glabrate form*);

* This was labeled *P. maculata* var. *pyrenaica* (Ramond) Lehm., which is quite a different plant, having thick leaves with short teeth directed forward.

Kuanersuit on Disco, *2710;* Engelskmandens Havn, Disco, *1879* (a slender depauperate form*).

POTENTILLA EMARGINATA Pursh, Fl. Am. Sept. 353. 1814

Undeveloped or depauperate specimens of this species resemble often very closely *P. nana* and I am now inclined to regard the two species as forms of one. In Alaska and other arctic regions of the American Continent they seem distinct enough but the plants from Greenland, Spitzbergen and Novaja Semlja are often so confusing that it is hard to tell to which to refer them.

The specimens collected by Mr. Pedersen are as follows, those approaching *P. nana* are marked by (?).

GREENLAND: Skarvefjord, 1898, *Pedersen, 279;* Ingigsok, *218a* and *218b;* Mudderbugten, *966* (?); Ekalunguit Itivnerit, *1414;* Plateau behind Ujaragsugsak, *3099;* all on Disco.

POTENTILLA NANA Willd.; Schlecht. Mag. Ges. Naturf. Fr. Berlin. **7**: 296. 1813

Among the many species of *P. emarginata* sent from Copenhagen, there are two sheets, however, that represent the typical *P. nana* with its round teeth and rounded obtuse sepals and bractlets, viz.:

GREENLAND: Manatsook, 1883, *Dr. Berlin;* Upernaviarsur, 1887, *Ryder, 7.*†

POTENTILLA NIVEA L. Sp. Pl. 499. 1753

Of the typical *P. nivea* the collection sent contains many sheets, the following was the only one collected by Mr. Pedersen:

GREENLAND: Rocks behind Kuanersuit on Disco, 1898, *M. Pedersen, 2706.*

---

*On the label is written "*Potentilla maculata* Pourr. var. *debilis* Lehm. in var. *hirtum* Lge. transiens." Lehmann cites under the var. *debilis*, *P. incisa* Desf. as a synonym. The latter is figured in Nestler's Monograph as a large plant with narrowly cuneate leaflets deeply incised at the apex, and quite unlike the specimens cited above. The latter I cannot distinguish from the typical *P. Langeana* except in size.

† The last was determined by Lange as *P. nivea prostrata*, which must be a mistake as it is unlike the other specimen collected by Vahl and does not agree with the description.

POTENTILLA NIVEA ALTAICA (Bunge) Rydb. Mem. Dep. Bot. Columbia Uni. **2**: 86. 1898

Potentilla nivea var. *arenosa* Lange Consp. Fl. Gr. 236. Not Turcz.

The specimens collected by Warming and Holm were determined by Lange as *P. nivea arenosa* Turcz. but that variety is described as having glomerate flowers, which is not the case in Warming and Holm's specimens. These do not differ from the common form of *P. nivea Altaica* except that the flowers are somewhat smaller. In fact they are as like the figure in Ledeb. Icon. Fl. Ross. **4**: 329 as I have seen. If Lange's determination in this case were correct the varieties *Altaica* and *arenosa* must be united. I think, however, that the latter is quite different and restricted to Asia. The following specimens belong here and are not recorded in Conspectus Florae Groenlandicae:

GREENLAND: Amaralik Fjord, 1831, *J. Vahl;* Scoresby Sound, 1892, *N. Hartz;* Kakatsiak, 1885, *S. Hanson;* Christianshaab, 1884, *Warming & Holm;* rocks behind Kuanersuit on Disco, 1898, *M. Pedersen 2702–5, 2707–9* (?);* Christianshaab, 1833, *J. Vahl* (?).†

POTENTILLA NIVEA PALLIDIOR Sw. Sum. Veg. Scand. 19. 1874

Potentilla nivea subviridis Ledeb. Fl. Ross. **2**: 57. 1844.

The following specimens belong here:

GREENLAND: Scoresby Sound, 1892, *N. Hartz;* Godhavn, 1871, *Th. Fries.*

Potentilla subquinata (Lange)

Potentilla nivea pentaphylla Lehm. Nov. Stirp. Pug. **9**: 69. 1851. Not *P. pentaphylla* Richt. 1815; *P. nivea subquinata* Lange, Consp. Fl. Groenl. 9. 1880; *P. nivea quinquefolia* Rydb.

---

* All of Mr. Pedersen's specimens are sterile and without fully developed leaves. They are remarkable for their long branching caudices and may belong to the variety of the next species described below or perhaps to an undescribed species. They cannot be determined satisfactorily.

† This was determined by Lange as var. *prostrata* but it does not agree with Rottboell's description especially as to the glomerate heads, sinuate-dentate leaves, revolute margins and purple veins. I refer this doubtfully here as it differs from all other specimens seen in the narrow leaflets.

Bull. Torr. Club, **23**: 302. 1896; *P. quinquefolia* Rydb. Mem. Dep. Bot. Columbia Univ. **2**: 76. 1898.

When I changed *P. nivea pentaphylla* Lehm. to *P. nivea quinquefolia*, I did not know that it was identical with Lange's var. *subquinata*. From his description, especially from the words "eleganter pinnatifidis" I was lead to the supposition that it represented the quinate form of var. *Altaica*. Consequently I referred Lange's var. *subquinata* to that variety. As Lange's name is older than my own, it should be adopted. I am well satisfied with the change, as my own as a specific name is a misnomer. The following specimens belong here.

GREENLAND: Disco Fjord, 1894, *P. Soerensen, 301;* Akingdlek, 1890, *N. Hartz, 1;* Kingua Orpiksuit, *2;* Atanekerdluk and Kuanersuit on Disco, 1871, *Th. Fries;* Kingigtok, 1890; *N. Hartz;* rocks behind Kuanersuit on Disco, 1898, *M. Pedersen, 2718, 2717, 2713, 2715a, 2712;* Disco Fjord, *3906;* Skansen, Disco, *927;* Kuganguak Valley, *2313* and *496;* Vajat-shore, Unartuarsuk, *113*.

SPITZBERGEN: Kap Thorsen, 1896, *E. Joergensen*.

Potentilla subquinata Pedersenii var. nov.

Caudex with elongated branches covered by the remains of old leaves; stems low, less than 1 dm. high, 1–3-flowered, as well as the petioles covered with long white hairs: leaflets small, 1–1.5 cm. long, broadly obovate: white silky on both sides and tomentose beneath, in age more glabrate above, bractlets very narrow, linear or linear-lanceolate.

GREENLAND: Vaigat Assuk, Disco, 1898, *M. Pedersen, 470* (type) and *1061a*. Rocks behind Kuanersuit, *2711, 2714, 2716*, and *2710;* Ingigsak, *233;* Rocks by Mudderbugten, *967*; Mungarut, *924;* all on Disco.

POTENTILLA VAHLIANA Lehm. Mon. Pot. 29 and 172. 1820

Fine specimens of this species were also in Pedersen's collection.

GREENLAND: Vajgat, Assuk on Disco, *M. Pedersen 1061b*. Lyngmarken by Godhaven, *80;* Rocks behind Kuanersuit on Disco, *2715b;* Roede Elv, Disco, *3441b*.

POTENTILLA PULCHELLA R. Br. in Ross' Voy. 142

GREENLAND : Kugsinarsuk, Disco, 1898, *M. Pedersen, 494 ;* Vaigat-shore, Assuk, *457* and *941 ;* Kutdlisat, *396a ;* Jameson's Land, 1891, *N. Hartz.*

POTENTILLA PULCHELLA ELATIOR Lange Consp. Fl. Groenl. 4. 1880

GREENLAND : Kardlunguak, 1890, *N. Hartz ;* Atanekerdluk, 1871, *Th. M. Fries ;* Vaigat Shore by Assuk, 1898, *M. Pedersen, 462.*

ARGENTINA EGEDII (Wormskj) Rydb. Mem. Dep. Bot. Columbia Uni. **2** : 158. 1898

GREENLAND : Disco Fjord by Kuanersuit, 1898, *M. Pedersen, 1448 ;* Ungorsivik by Maligiak, *438.*

Some new Fungi

By S. M. Tracy and F. S. Earle

Meliola anomala sp. nov.

Epiphyllous, forming black, velvety, usually orbicular patches, 2–5 mm. in diameter, often with a grayish border; perithecial mycelium rather scanty, of thick, brown, opake, frequently septate threads about 8 μ in diameter; conidial (?) mycelium abundant, of nearly hyaline, slender, branching threads about 4 μ in diameter; conidia not seen; capitate hyphopodia very numerous, often densely crowded, usually the upper cell oval to ovate, smoothly rounded, about 16 × 12 μ, occasionally angled or sublobate and very rarely elongate and once septate, basal cell small and short, about 6 × 6 μ; mucronate hyphopodia none; setae very numerous, dark brown, frequently septate, tip entire, blunt, the upper third usually conspicuously flexed and irregular, 200–300 μ long, base about 7 μ thick, tip 4 μ thick; perithecia scattered, abundant, about 200 μ in diameter, of soft, small-celled parenchyma, cells about 8 μ; asci clavate to obovate, pedicellate and conspicuously fascicled, 8-spored, about 100 × 20–40 μ; ascospores inordinate, strongly clavate, broad above, narrowed to a blunt point below, light fuliginous, 4-septate, 40–45 μ long, 12 μ broad above, 4 μ broad below.

On living leaves of *Persea* sp., Palma Sola, Fla., May 14, 1900, S. M. Tracy, no. 6600.

This interesting species is evidently closely related to *Meliola clavatispora* Speg. but it differs from published descriptions of that species in the much longer and curiously flexed and irregular setae, and in the stalked not sessile hyphopodia.

If this is to be considered a true *Meliola* and there seems no reason to doubt it, it would seem to effectively dispose of the scheme of classification proposed by some recent authors by which *Meliola* has been taken from its natural allies among the Perisporiaceae and thrust in among the exceedingly different Aspergillales. In this species the asci are as conspicuously fascicled as in any of the Sphaeriales.

Hysterostomella Floridana sp. nov.

Epiphyllous, scattered, spots none; stromata black, superficial, crust-like, 1–4 mm. in diameter, the margin sterile and smooth, the central portion rugose with irregular elongated ridges formed by the connivent lips of the poorly defined subconfluent ascomata, the margin bordered by a narrow indistinct, *Lembosia*-like subiculum of anastomosing fuscus threads: asci broadly oval, aparaphysate, rather thick-walled, 30–35 × 20–25 μ; ascospores eight, inordinate, narrowly ovate, about equally uniseptate, constricted, ends obtuse or the narrower one subacute, hyaline to light olivaceous (probably darker with age), 16–18 × 6–7 μ.

On leaves of *Ardesia Pickeringii*, Manatee, Fla., May 11, 1900, S. M. Tracy, no. 6612.

The five previously described species of this little-known tropical genus are all from South America. It is evidently closely related to *Lembosia* from which it can only be separated by the compound stroma-like ascoma.

This peculiar group of black, superficial, mostly tropical fungi has always been classed in the Hysteriales on account of their elongated ascomata that open by a slit. This seems to be only a superficial resemblance, their real affinity as indicated by mode of growth, structure of the ascoma and characters of spores and asci being much closer to the Microthyriaceae.

Hysterostomella sabalicola sp. nov.

Hypophyllous, scattered on small, irregular, yellow spots; stromata black, scutellate, small, irregularly oval, .75–1 mm. in diameter, sterile margin narrow, 50 μ, of compacted parallel radiating threads, subiculum none, central portion elevated and rugose from the long, irregular connivent lips of the poorly defined ascomata: asci oval, about 40–50 × 20 μ; ascospores eight, inordinate, equally uniseptate, nearly hyaline (perhaps young), about 20 × 6 μ.

On leaves of *Sabal Palmetto*, Longboat Key, Fla., April 26, 1900, S. M. Tracy, no. 6597.

Lembosia brevis sp. nov.

Epiphyllous on irregular brownish spots 2–4 mm. in diameter; ascomata thickly scattered black, crust-like, usually simple and distinct, but occasionally forking or sparingly confluent, very short, ends obtuse, 100–175 × 70–80 μ, subiculum reduced to a fringe of

numerous parallel, simple, fuscous threads about 10–20 × 2–3 μ; asci oval, about 20 × 16 μ; ascospores eight, inordinate, oblong, ends obtuse, nearly equally uniseptate, subhyaline (young) about 8–10 × 4 μ.

On living leaves of *Ilex* sp., Longboat Key, Fla., April 27, 1900, S. M. Tracy, no. 6570.

This differs from any of the described species on *Ilex* in the numerous very short ascomata and especially in the character of the subiculum.

Lembosia cactorum sp. nov.

Scattered without definite spots; ascomata black, shining, straight, distinct not anastamosing or forking, rather thick or subelevated, with the aspect of a small *Hysterium*, 200–500 × 100–150 μ, ends obtuse, lips connivent or slightly parted, subiculum of agglutinated and anastomosing threads 2–4 μ in diameter, and usually extending to 20–40 μ or more, epithecium well developed; asci oval, 25–30 × 16–20 μ: ascospores eight, narrowly ovate, inordinate, unequally uniseptate, ends obtuse, hyaline (?) about 12 × 4 μ.

On *Opuntia vulgaris*, Palma Sola, Fla., May 2, 1900, S. M. Tracy, no. 6592.

This species departs somewhat widely from the usual *Lembosia* type. The ascoma is better developed and firmer. This with the presence of an epithecium points to a relationship with the true Hysteriaceae.

The color of the spores is not a reliable character in this group. They are usually long hyaline or faintly tinted, only becoming dark (usually brownish) with age.

Acanthostigma conocarpi sp. nov.

Amphigenous but mostly hypophyllous, scattered, without spots; perithecia minute, subconic, brown, of thin, delicate, obscurely cellular parenchyma, 75–90 μ, clothed with scattered, erect, rigid, entire, dark fuscous, opake bristles 40–50 μ long, base about 4 μ wide, tapering upward to an acute point; asci oblong or slightly obovate, short-pedicillate, about 40 × 10 μ; paraphyses thread-like, slightly exceeding the asci; ascospores distichous, cylindric-clavate, anterior end obtuse, posterior subacute, twice septate, not constricted, hyaline, about 12 × 3 μ.

On leaves of *Conocarpus sericea* (DC.) Frank, Longboat Key, Fla., April 27, 1900, S. M. Tracy, no. 6573.

This is related to *A. Berenice* (B. & C.) Sacc. on *Magnolia* leaves but it is smaller in all of its parts and the spores are only 2-septate.

Plowrightia circumscissa sp. nov.

Thickly scattered over large deadened areas; stromata black, buried in the leaf substance, at length exposed by the circumscissile breaking away of the epidermis, irregularly oval or suborbicular, occasionally confluent, ⅓–1 mm., ostioles punctate, three or four to eight or more in each stroma; asci stipitate, aparaphysate, thick-walled, about 60–80 × 16 μ; ascospores subdistichous, ovate, at length about equally uniseptate, hyaline, about 20 × 5 μ.

On languishing leaves of some aloe (*Agave* sp. ?), Longboat Key, Fla., April 26, 1900, S. M. Tracy, no. 6596.

This is a striking species from the peculiar way in which the innate fungus frees itself from the epidermis of the host. The dead areas often involve the tips of the leaves but in other cases they are lateral.

Cercospora convolvuli sp. nov.

Amphigenous, widely effused, forming large olivaceous areas, without definite spots and only slightly discoloring the leaf; conidiophores cespitose in divergent clusters of 10 to 20 or more, not tuberculate, brown, at first continuous, the lower half becoming conspicuously septate at intervals of 4–8 μ, upper half continuous, variously contorted and marked by conidial scars, about 40–50 × 5 μ; conidia hyaline, clavate or subcylindric, usually curved, continuous or at length obscurely and sparingly septate, 60–100 × 3–4 μ.

On leaves of *Convolvulus acetosæfolia*, Breton Island, La., Aug. 18, 1900, Tracy & Lloyd, no. 593.

Cercospora torta sp. nov.

Hypophyllous, widely effused, discoloring the leaf above but not forming definite spots; conidiophores scattered, not fascicled, long and slender, nearly straight, frequently septate, when dry flattened and seeming twisted at the septa, 60 μ or more long, about 4 μ wide; conidia long, slender, subcylindric, at length multiseptate, about 80 × 3 μ.

On *Cynoctonum petiolata* (*Mitreola*), Ocean Springs, Miss., Sept. 15; 1900, Tracy & Lloyd, no. 590.

Passalora (?) melioloides sp. nov.

Epiphyllous, forming black, velvety, orbicular patches 2–3 mm. in diameter, or confluent over larger areas; mycelium abundant,

superficial, of straight, rigid, creeping, fucous threads about 4 μ in diameter, and septate at intervals of 20–30 μ; conidiophores erect, rigid, simple, dark fuscous, opake, about 150–200 × 6 μ, septate at intervals of 12–20 μ; conidia solitary, acrogenous, light fuscous, narrowly oval, uniseptate, scarcely constricted, about 25 × 6 μ.

On living leaves of *Quercus Virginiana*, Clearwater, Fla., April 20, 1900, S. M. Tracy, no. 6608.

The generic position of this fungus is doubtful. It is much larger and more conspicuous than those usually referred to *Passalora* and in that genus no mention is made of a superficial mycelium. At first glance it resembles a *Meliola* but no hyphopodia are present and there are no perithecia. The same thing was taken several years ago on this host at Ocean Springs, Miss., but at this writing the specimens are not accessible.

Proceedings of the Club

Annual Meeting, January 8, 1901

Professor Rusby in the chair; seventeen persons present.

Annual reports were presented, as follows:

The Secretary, Professor E. S. Burgess, reported fifteen meetings held during the year, with an average attendance of thirty-eight; nineteen active members were elected. The active membership is now 238, the total membership 383; twenty papers have been presented besides twenty-six brief notes of collections or of botanical progress.

The Editor, Professor L. M. Underwood, reported a continued increase in the number of pages and of plates in the Club's publications, including in Volume 27 of the Bulletin, 666 pages and 33 plates, and including Volume 9 of the Memoirs with 292 pages and 9 plates.

Reports were also received from the Corresponding Secretary, Curator and Librarian.

No report was received from the Treasurer, Mr. M. L. Delafield, Jr., owing to his protracted illness.

Dr. P. A. Rydberg, as Chairman of the Library and Herbarium Committee, reported on the present unsatisfactory condition of the Club's Herbarium, as to care, accessibility and determination. The suggestion was made, therefore, that the Club donate its herbarium to the New York Botanical Garden under such conditions as these:

(*a*) That the Torrey Botanical Club herbarium should constitute the nucleus of the separate local collections of the Garden, to be known as the Torrey Botanical Club Local Herbarium or by some similar name agreed upon.

(*b*) That the Garden take proper care of the same, supplement it from its own collections and from future gifts from members of the Club and other persons, so that it may contain representatives of all of the species growing within the 100-mile limit.

(*c*) That the members of the Garden staff keep the specimens

properly named and labeled, so that the collection may be of the greatest possible service.

(*d*) That all members of the Club shall have full and free access to this collection.

The annual election of officers followed, with the following result: *President*, Hon. Addison Brown. *Vice-Presidents*, Dr. T. F. Allen, Dr. H. H. Rusby. *Treasurer*, Dr. H. B. Ferguson. *Recording Secretary*, Prof. E. S. Burgess. *Corresponding Secretary*, Dr. J. K. Small. *Editor*, Prof. L. M. Underwood. *Associate Editors*, Dr. C. C. Curtis, Dr. M. A. Howe, Prof. F. E. Lloyd, Dr. D. T. MacDougal, Dr. H. M. Richards, Miss Anna Murray Vail. *Curator*, Dr. P. A. Rydberg. *Librarian*, Miss Anna Murray Vail.

Other business transacted included the following :

Three resignations were accepted, of Miss F. K. Sturgis, Miss Helen M. Ingersoll, Miss M. A. Johnston.

Two active members were elected, Mrs. Josephine D. Lowe, Lowecroft, Noroton, Fairfield Co., Conn. ; Mr. E. G. Buttrick, Winchendon, Mass.

Two nominations for active membership were made.

An amendment to the Constitution was adopted, pursuant to the report of a Special Committee at the preceding meeting. By this amendment, Section XIV. of the Constitution will read as follows :

" Each active member upon his election and annually thereafter shall pay to the Treasurer the sum of four dollars, which shall entitle him to a copy of the Bulletin for the year, and if he desires it, to a copy of such Memoirs as are published during the year, for one dollar additional."

Discussion followed upon the need of the establishment by the Club of a monthly for the publication of notes and botanical matter of a popular nature, especially with view to stimulate local botany, to be sold only by subscription ; the space of the Bulletin being now wholly needed for technical matter.

The following resolutions offered by Dr. Britton were then adopted :

" RESOLVED : That the publication by the Club of a monthly

periodical is desirable, to contain short articles and notes with special reference to the study of the local flora, thus covering the ground occupied by the Bulletin at its establishment in 1870.

"RESOLVED: That the editors be authorized and requested to proceed at once with the publication of such a periodical and to designate an editor for it from their number.

"RESOLVED: That until further advised by the Club, the editors be instructed to print not more than twelve pages per month in an edition not to exceed five hundred copies, and to accept subscriptions for said periodical at one dollar per annum.

"RESOLVED: That this periodical bear the name 'Torreya' in honor of Dr. John Torrey, the founder of the Club."

WEDNESDAY, JANUARY 30, 1901

This meeting was held at the Museum of the Botanical Garden at 4 p. m. Dr. T. F. Allen presided; 26 persons were present. Two new members were elected: Miss Elsie Kupfer, 44 W. 97 St.; Mr. George Wirsing, 104 Bowers St., Jersey City.

Dr. Allen made to the Club a suggestion that he donate his collection of Characeae to the Botanical Garden to ensure its preservation. It contains numerous specimens from all over the world, and very many type specimens.

Dr. Britton remarked that this collection is one of the most complete and authoritative in existence, and would be a valuable accession to the Garden.

Dr. Underwood reported an interview with the Librarian of Columbia University, who accepts the proposition of January 8th, regarding future exchanges.

It was thereupon moved and adopted that the future exchanges of the Club become the property of the Botanical Garden (except in case of sets which are already in part the property of Columbia University) with the proviso that the Garden reciprocate by allowing to all members of the Club, full and free access to the Garden Library.

On motion of Dr. Underwood, elections were made and resolutions were adopted as follows:

1. Dr. N. L. Britton was made one of the Board of Editors.

2. Dr. M. A. Howe was made Editor of the Club's new journal Torreya.

3. The matter of subscriptions to Torreya was turned over to the Treasurer.

4. The Board of Editors was allowed one hundred dollars toward defraying the expenses of the new journal Torreya.

5. To all members of the Club, Torreya is to be sent free.

The scientific program was as follows: E. S. Burgess, "Remarks on the History of *Aster Claytoni*"; E. G. Britton, "Some Mosses collected in Washington State by F. L. Gardner." The second paper was deferred on account of the lateness of the hour.

The paper by E. S. Burgess on the history of *Aster Claytoni*, which will soon appear in print, was illustrated by a series of specimens showing type and variations, and a range from the Hudson River to Virginia. The first specimen known was collected in the mountains of Virginia by John Clayton, apparently in or before 1754, during his botanical expedition along the James or that to the sources of the Rappahannock. It is no. 767 of the Gronovian herbarium preserved by the British Museum. Comparisons kindly made by Mr. Edmund G. Baker, of the British Museum, show its identity with plants observed first on Manhattan Island at Inwood, by E. S. Burgess, in 1896, and kept under observation since for study of development. The description of no. 767 written by Clayton and Gronovius, and published in the Flora Virginica, Part III., in 1762, without a specific name, long remained without reference to any of our known native species, Forster's reference in 1771 to *Aster macrophyllus* proving untenable. In reestablishing the species in the Illustrated Flora in 1898 under the name *Aster Claytoni*, it was intended to pay this tardy tribute to the memory of its discoverer, John Clayton, rightly styled by Collinson as at that period, 1764, "the greatest botanist of America." The species seems particularly frequent in the lower Hudson region, where it had however been hitherto confused with its smoother and more forking ally, *Aster divaricatus*.

EDWARD S. BURGESS,

Secretary.

Arcangeli, G. Altre osservazioni sull' *Araucaria imbricata* Pav. e sull' *A. Brasiliensis* A. Rich. Bull. Soc. Bot. Ital. 1900: 314–317. D. 1900.

Bailey, W. W. Notes on the Flora of Rhode Island. Rhodora, 3: 33, 34. F. 1901.

Barton, E. S. On certain Galls in *Furcellaria* and *Chondrus*. Jour. Bot. 39: 49–51. *pl. 418*. F. 1901.

Beal, W. J. Tumble-Weeds. Rhodora, 3: 18. 2 Ja. 1901.
Contains list of nine tumble-weeds of Michigan.

Bennetts, W. J. Additions to the Flora of Milwaukee County. Bull. Wis. Nat. Hist. Soc. II. 1: 161–166. Jl. 1900.

Bennetts, W. J. November Wild Flowers. Bull. Wis. Soc. Nat. Hist. II. 1: 186, 187. Jl. 1900.
A list of 36 species observed in the vicinity of Milwaukee Nov. 1–5, 1900.

Bessey, C. E. *Baptisia tinctoria* as a Tumble-weed. Rhodora, 3: 34, 35. F. 1901.

Brainerd, E. *Scirpus atratus* a synonym of *Scirpus Peckii*. Rhodora, 3: 31–33. F. 1901.

Brandegee, K. Some Sources of Error in Genera and Species. Zoe, 5: 91–98. 6 F. 1901.

Brandegee, T. S. New Species of Plants, mainly from Baja California. Zoe, 5: 104–106. 6 F. 1901.
New species in *Ranunculus*, *Malpighia*, *Brongniartia*, *Houstonia*, *Perezia* and *Bumelia* (2).

Britten, J. Some proposed Changes in Nomenclature. Jour. Bot. 39: 67–69. F. 1901.

Bruncken, E. Distribution of some Trees and Shrubs in the Vicinity of Milwaukee. Bull. Wis. Nat. Hist. Soc. II. 1: 31–42. Ja. 1900.

Bruncken, E. On the Forest Conditions in the Vicinity of Milwaukee. Bull. Wis. Nat. Hist. Soc. II. 1: 179–184. Jl. 1900.

Bruncken, E. Some remarkable Trees in the Vicinity of Milwaukee. Bull. Wis. Nat. Hist. Soc. II. 1: 43–45. Ja. 1900.

Christ, H. Filices, Equisetaceae, Lycopodiaceae, Selaginellaceae, Rhizocarpaceae. Primitiae Florae Costaricensis, 3: 1–66. 1901.

New species and varieties in *Trichomanes*, *Elaphoglossum*, *Pleurogramme*, *Polypodium*, *Adiantum*, *Pellaea*, *Pteris*, *Asplenium*, *Diplazium*, *Aspidium*, *Phegopteris*, *Dennstaedtia*, *Cyathea*, *Alsophila*, *Hemitelia*, *Botrychium* and *Lycopodium*.

Dangeard, P. A. La reproduction sexuelle des champignons. Le Botaniste, **7**: 89–130. My. 1900.

Dangeard, P. A. Les zoochorelles du *Paramoecium bursaria*. Le Botaniste, **7**: 161–191. My. 1900.

Dangeard, P. A. Observations sur le developpement du *Pandorina morum*. Le Botaniste, **7**: 192–208. *pl. 1*. My. 1900.

Dangeard, P. A. Programme d'un essai sur la reproduction sexuelle. Le Botaniste, **7**: 257–268. Au. 1900.

Dangeard, P. A. Recherches sur la structure du *Polyphagus euglenae* Nowak, et sa reproduction sexuelle. Le Botaniste, **7**: 213–257. *f. 3*. Au. 1900.

Davenport, G. E. A plumose Variety of the ebony Spleenwort. Rhodora, **3**: 1, 2. *pl. 22*. 2 Ja. 1901.

Asplenium ebeneum Hortonae var. nov.

Driggs, A. W. *Botrychium matricariaefolium* in Connecticut. Rhodora, **3**: 36. F. 1901.

D[ruery], C. T. Cacti in their natural Habitats. Garden, **59**: 25, 26. 12 Ja. 1901.

Notes on cacti and other plants in northern Mexico.

Duggar, B. M., & Stewart, F. C. The sterile Fungus Rhizoctonia as a Cause of Plant Diseases in America. Bull. Cornell Univ. Agric. Exp. Sta. 186: 51–76. *f. 15–23*. Ja. 1901.

Eastwood, A. *Asclepias Kotolo*. Zoe, **5**: 98, 99. 6 F. 1901.

Eastwood, A. A Study of *Erysimum grandiflorum* Nutt. and the Species aggregated under it. Zoe, **5**: 100–103. 6 F. 1901.

Erysimum concinnum sp. nov.

Evans, A. W. *Fossombronia salina* in Connecticut. Rhodora, **3**: 7–10. 2 Ja. 1901. [Illust.]

Fernald, M. L. *Monarda fistulosa* and its Allies. Rhodora, **3**: 13–16. 2 Ja. 1901.

M. mollis menthaefolia (Graham) Fernald, new name.

Geheeb, A. Révision des mousses récoltées en Bresil dans la province de San Paulo par M. Juan J. Puiggari pendant les années 1877–1882. Rev. Bryol. **28**: 9–11. 1901.

Greene, E. L. New or noteworthy Species—XXVIII. Pittonia, **4**: 233–241. 5 Ja. 1901.

New species in *Thalictrum*, *Rumex* (2), *Lappula*, *Allocarya* (2), *Solidago*, *Coleosanthus* (5), *Corcopsis*, *Parthenium*, *Picradenia* and *Zygadenus* (2).

Greene, E. L. Studies in the Compositae—VIII. Pittonia, **4**: 242–284. 26 Ja. 1901.

New species in *Bidens* (20), *Megalodonta* (gen. nov.) (2), *Conoclinium* (3), *Eupatorium* (8) and *Antennaria*.

Greene, E. L. *Taraxacum* in North America. Pittonia, **4**: 227–233. 5 Ja. 1901.

Eight new species described.

Graenicher, S. The Fertilization of *Symphoricarpos* and *Lonicera*. Bull. Wis. Nat. Hist. Soc. II. **1**: 141–156. *f. 1–6.* Jl. 1900.

Greenman, J. M. The Genus *Senecio* in New England. Rhodora, **3**: 3–7. 2 Ja. 1901.

Eight species enumerated. *S. Balsamitae pauperculus* (Mx.) Fernald, and *S. Balsamitae praelongus*, new varieties.

Heller, A. A. Catalogue of North American Plants north of Mexico, exclusive of the lower Cryptogams. Second edition. 1–252. [Lancaster, Pa.] 10 N. 1900.

16,673 species and varieties enumerated, besides the additions and corrections. Pp. 3–8 contain new combinations in nomenclature.

Heller, A. A. Some Changes in Nomenclature. Muhlenbergia, **1**: 1–8. 10 N. 1900.

A continuation of pp. 3–8 of the second edition of his catalogue of North American Plants.

Hennings, P. Fungi mattogrossenses a Dr. R. Pilger collecti 1899. Hedwigia (Beiblatt), **39**: (134)–(139). 10 Au. 1900.

New species in *Marasmius*, *Pluteus*, *Pleurotus*, *Lycoperdon*, *Dimerosporium*, *Pilgeriella* (gen. nov.), *Hypoxylon*, and *Aschersonia*.

Heydrich, F. Die Lithothamnien des Museum d'histoire naturelle in Paris. Engler's Bot. Jahrb. **28**: 529–545. *pl. 11.* 11 Ja. 1901.

New species and new names in *Melobesia*, *Lithophyllum* (5), *Lithothamnion* (5), from California, Bermuda, Labrador and South America.

Hieronymus, G. Plantae Lehmannianae praesertim in Columbia et Ecuador collectae, Compositae II. Engler's Bot. Jahrb. **28**: 559–659. 11 Ja. 1901.

New species in *Vernonia*, *Stevia*, *Eupatorium*, *Mikania*, *Bigelovia*, *Egletes*, *Baccharis*, *Achyrocline*, *Greenmania* gen. nov., *Clibadium*, *Polymnia*, *Stemmatella*, *Wedelia*, *Aspilia*, *Viguiera*, *Spilanthes*, *Verbesina*, *Calea*, *Galinsoga*, *Pectis*, *Liabum*, *Gynoxys*, *Senecio*, *Werneria*, *Chuquiragua*, *Mutisia*, *Trixis*, and *Jungia*.

Kellerman, W. A. Twelve Additions to the Ohio Plant List. Ohio Naturalist, **1**: 59, 60. F. 1901.

Marshall, N. L. The Mushroom Book. 8vo. i–xxvi, 1–167. *pl. 1–48.* New York, 1901. [Illust.]

A popular guide to the study of fleshy fungi, with reproductions in color of photographs by J. A. and H. C. Anderson.

Meehan, T. *Aster concolor.* Meehan's Monthly, **10**: 161, 162. *pl. 11.* N. 1900.

Meehan, T. *Aster tanacetifolius.* Meehan's Monthly, **11**: 1, 2. *pl. 1.* Ja. 1901.

Meehan, T. *Helianthus lenticularis.* Meehan's Monthly, **11**: 17, 18. *pl. 2.* F. 1901.

Murdoch, J., Jr. *Cycloloma* on Cape Cod. Rhodora, **3**: 18. 2 Ja. 1901.

Parish, S. B. The Vegetation of Plymouth three hundred Years ago. Rhodora, **3**: 17. 2 Ja. 1901.

Penhallow, D. P. A Decade of North American Palaeobotany. 1890–1900. Science, II. **13**: 161–176. 1 F. 1901.

Quaintance, A. L. The Brown Rot of Peaches, Plums and other Fruits (*Monilia fructigena* Persoon). Bull. Ga. Exp. Sta. **50**: 237–269. *f. 1–9.* O. 1900.

Ravn, F. K. Nogle *Helminthosporium-Aster* og de af dem fremkaldte Sygdomme hos Byg og Havre. Bot. Tidsskrift, **23**: 101–322. *pl. 1–2.* 1 Ja. 1901.

Rehder, A. Ein Ausflug nach Nord-Carolina. Mitteil. Deutsch. Dendrol. Gesellsch. 9: 89–94. 1900.

Renauld, F. Notice sur un *Limnobium* de l'Amérique du Nord et une forme analogue des Pyrénées. Rev. Bryol. **28**: 8. 1901.

Hypnum (*Lymnobium*) *Bestii* Ren. & Bryhn.

Robinson, B. L. The correct Disposition of *Sisymbrium Niagarense.* Rhodora, **3**: 16, 17. 2 Ja. 1901.

This species is found identical with *Brassica nigra* Koch.

Robinson, B. L. The Identity of the Linnaean *Gnaphalium plantaginifolium.* Rhodora, **3**: 11–13. 2 Ja. 1901.

Rothrock, J. T. Cottonwood, Carolina Poplar, Necklace Poplar (*Populus monilifera* Ait.). Forest Leaves, **7**: 184, 185. D. 1900. [Illust.]

Rothrock, J. T. June Berry, or Shad Bush, *Amelanchier Canadensis* T. & G. Forest Leaves, **8**: 8. F. 1901.

Paper accompanied by two full-page half-tones of unusually large specimens.

Sargent, C. S. Notes on *Crataegus* in the Champlain Valley. Rhodora, **3**: 19–31. F. 1901.

C. Champlainensis, C. Pringlei, C. lobulata, C. acutiloba, C. matura, C. pastorum, C. pentandra, C. praecox, C. Brainerdi, C. modesta, C. scabrida, C. Egglestoni and *C. asperifolia*, new species.

Schneck, J. The American Lotus—Longfellow vindicated. Meehan's Monthly, **10**: 163–165. *f. 1, 2.* N. 1900.

Schrenk, H. von. A Disease of the Black Locust (*Robinia Pseudacacia*). Rep. Mo. Bot. Gard. **12**: 21–31. *pl. 1, 2.* 10 F. 1901.

Polyporus rimosus Berk.

Schumann, K. *Cereus Wittii.* Gard. Chron. III. **29**: 38. *f. 17.* 19 Ja. 1901.

A climbing cactus from Brazil.

Smith, A. L. Myxobacteria. Journ. Bot. **39**: 69–72. F. 1901. [Illust.]

Sodiro, L. Contribuciones al conocimiento de la Flora Ecuatoriana, I. Piperaceas Ecuatorianas, 1–162. Quito, 1900.

Includes numerous new species.

Stephani, F. Species Hepaticarum. Bull. Herb. Boissier, II. **1**: 140–177. 30 Ja. 1901.

Marsupella Lorentziana, new American species; also numerous changes in nomenclature.

Stewart, F. C. An Anthracnose and a Stem Rot of the cultivated Snapdragon. Bull. N. Y. Agric. Exp. Sta. 179: 105–110. *pl. 1–3.* N. 1900.

Colletotrichum antirrhini sp. nov.

Stone, G. E. Formalin as a Preservative for Botanical Specimens. Jour. Applied Microscopy, **2**: 537–540. *f. 1–4.* 1900.

Stone, G. E. & Smith, R. E. Report of the Botanists. Ann. Rep. Hatch Exp. Sta. **12**: 56–73. 1900. [Map.]

Sydow, H. & P. Fungi novi Brasilienses a cl. Ule lecti. Bull. Herb. Boissier, II. **1**: 77–85. 29 D. 1900.

New species and varieties in *Uredo, Stigmatula, Mycosphaerella, Physalospora, Didymella, Didymosphaeria, Lizonia, Licopolia* (gen. nov.), *Xylaria, Phyllachora* (3), *Micropeltis, Polystomella, Dimerosporium, Phyllosticta* (6), *Pazschkeella* (gen. nov.), *Septoria* (3), *Leptothyrium, Pestalozzia, Helminthosporium* (2), and *Stilbella.*

Trelease, W. Edible and poisonous Mushrooms and Toadstools. Ann. Rep. Mo. State Hort. Soc. **43**:—(1–18). [1900.] [Illust.]

True, R. H. The toxic Action of a Series of Acids and of their Sodium Salts on *Lupinus albus.* Am. Jour. Sci. **9**: 183–192. Mr. 1900.

Weinzirl, J. The bacterial Flora of the semi-desert Region of New Mexico, with especial Reference to the Bacteria of the Air. Jour. Cin. Soc. Nat. Hist. **19**: 211–242. *f. 1–4.* 28 D. 1900.

Wildeman, E. de. *Anisacanthus virgularis* Nees. Ic. Select. Hort. Thenensis, 1 : 143. *pl. 33.* S. 1900.
A Mexican species.

Wildeman, E. de. *Berberis tenuifolia* Lindl. Ic. Select. Hort. Thenensis, 1 : 45. *pl. 11.* F. 1900.
A Mexican species.

Wildeman, E. de. *Cavendishia pubescens* Hemsl. Ic. Select. Hort. Thenensis, 1 : 103. *pl. 24.* Je. 1900.
A species from Central and Tropical South America.

Wildeman, E. de. *Escalonia viscosa* Forbes. Ic. Select. Hort. Thenensis, 1 : 65. *pl. 16.* My. 1900.
A species from the Andes of Chili.

Wildeman, E. de. *Gordonia Lasianthus* L. Ic. Select. Hort. Thenensis, 2 : 1. *pl. 41.* N. 1900.

Wildeman, E. de. *Leucothoë recurva* A. Gray. Ic. Select. Hort. Thenensis, 1 : 171. *pl. 40.* O. 1900.

Wildeman, E. de. *Maytenus ilicifolia* Mart. Ic. Select. Hort. Thenensis, 1 : 155. *pl. 36.* O. 1900.
A species from southern Brazil and Uruguay.

Wildeman, E. de. *Oxalis Ortgiesi* Regel. Ic. Select. Hort. Thenensis, 1 : 19. *pl. 5.* S. 1899.
A species from the Andes of Peru.

Wildeman, E. de. *Ugni Molinae* Turcz. Ic. Select. Hort. Thenensis, 1 : 121. *pl. 28.* Au. 1900.
A species from southern Chili.

Williams, E. F. Extended Ranges in *Cyperus* and *Hieracium*. Rhodora, 3 : 36, 37. F. 1901.

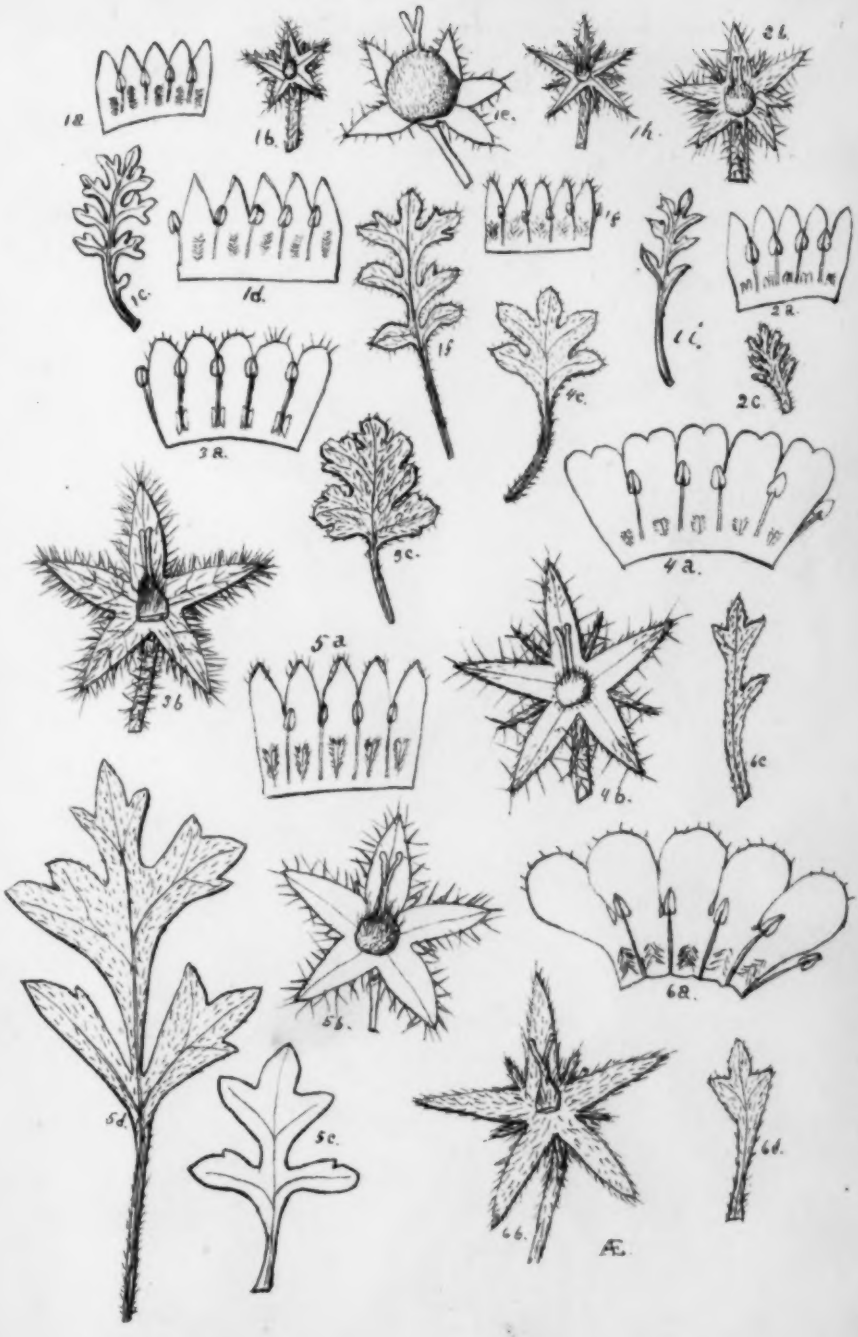
Williams, E. F. Two Erodiums at Tewksbury, Massachusetts. Rhodora, 3 : 35. F. 1901.

Williams, E. M. The rosy Tricholoma (*Tricholoma rubicunda* Peck). Plant World, 4 : 9–11. Ja. 1901. [Illust.]

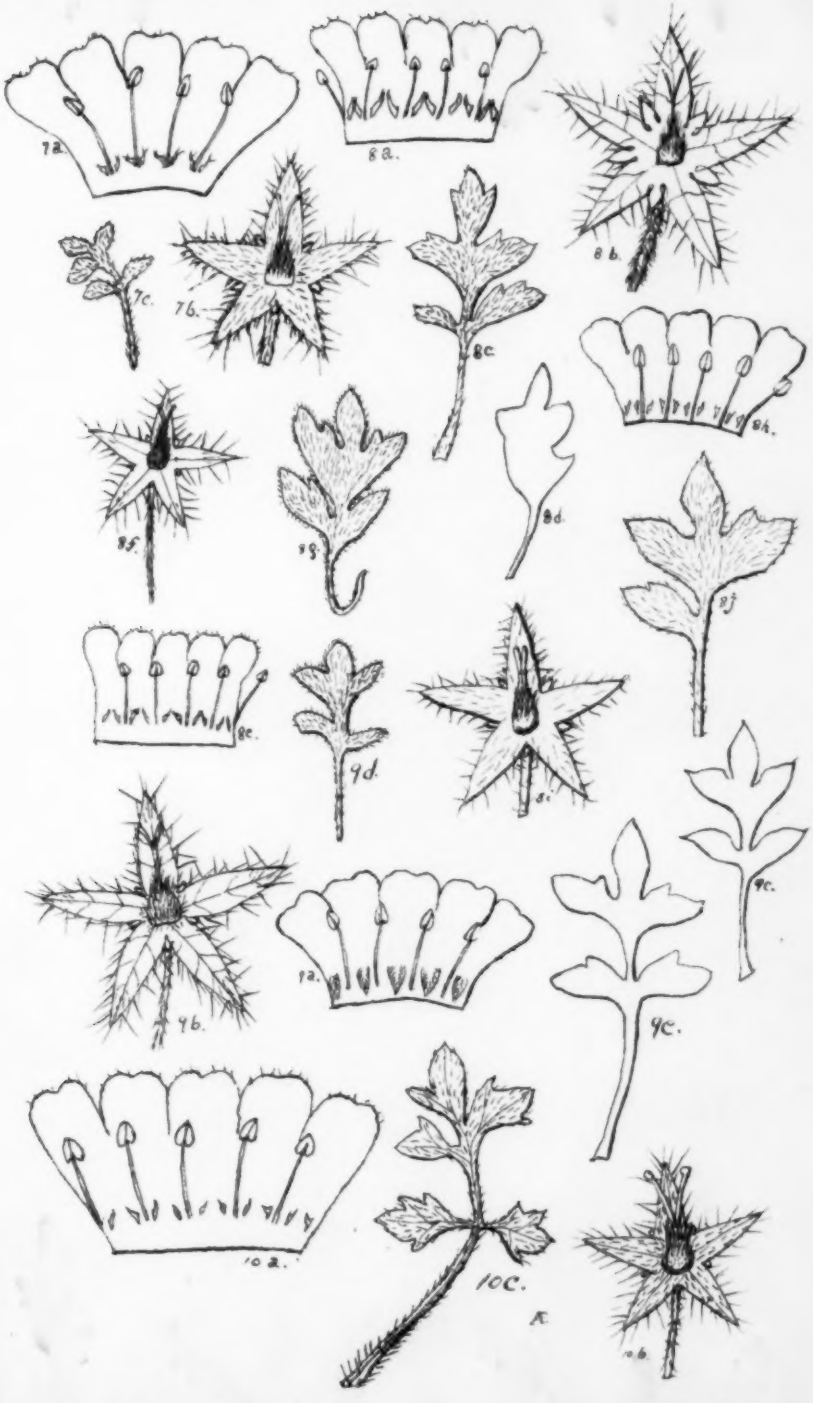
Williams, R. S. *Funaria flavicans* Michx. Bryologist, 4 : 9, 10. Ja. 1901. [Illust.]

Williams, R. S. *Timmia cucullata* Michx. Rev. Bryol. 28 : 1. 1901.

Worsdell, W. C. The comparative Anatomy of certain Species of *Encephalartos* Lehm. Trans. Linn. Soc. II. 5 : 445–459. *pl. 43.* O. 1900.

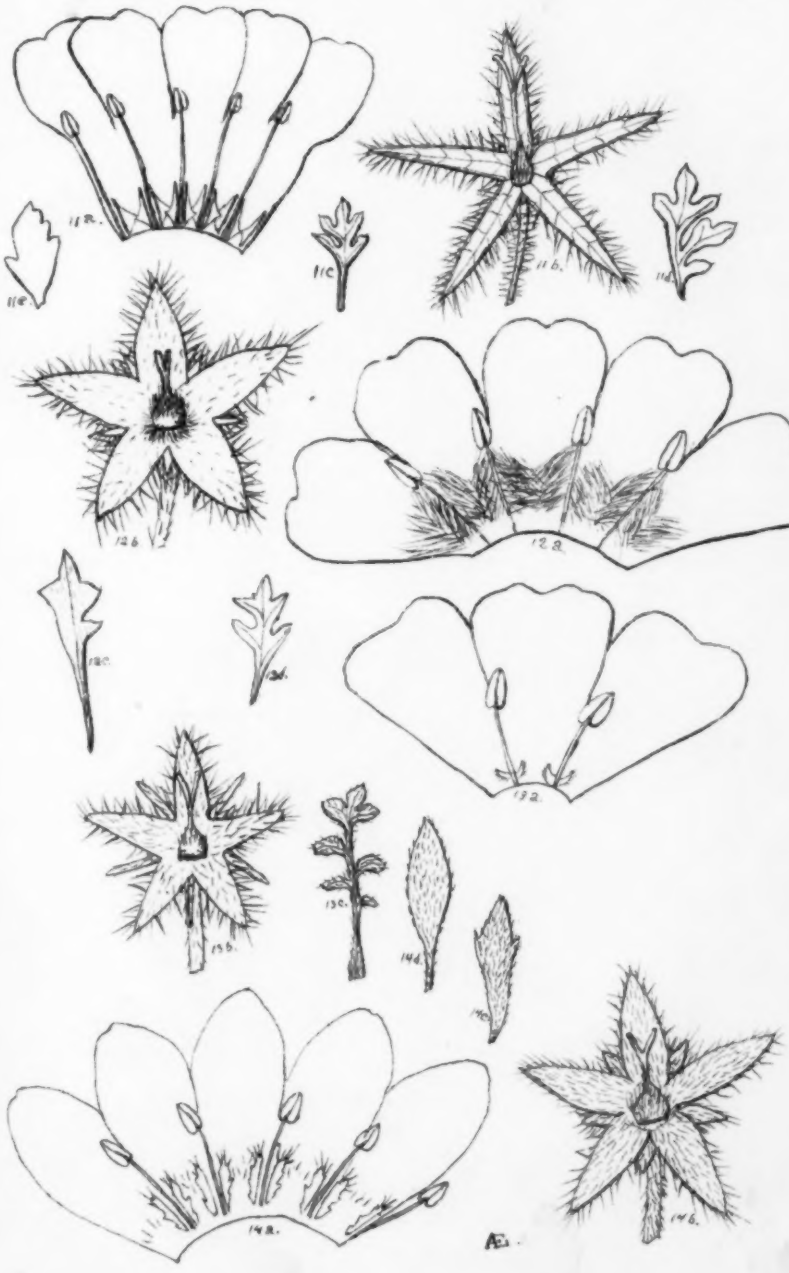


1. Nemophila humifusa. 2. N. sepulta. 3. N. quercifolia. 4. N. Austinae.
5. N. macrophylla. 6. N. inconspicua.

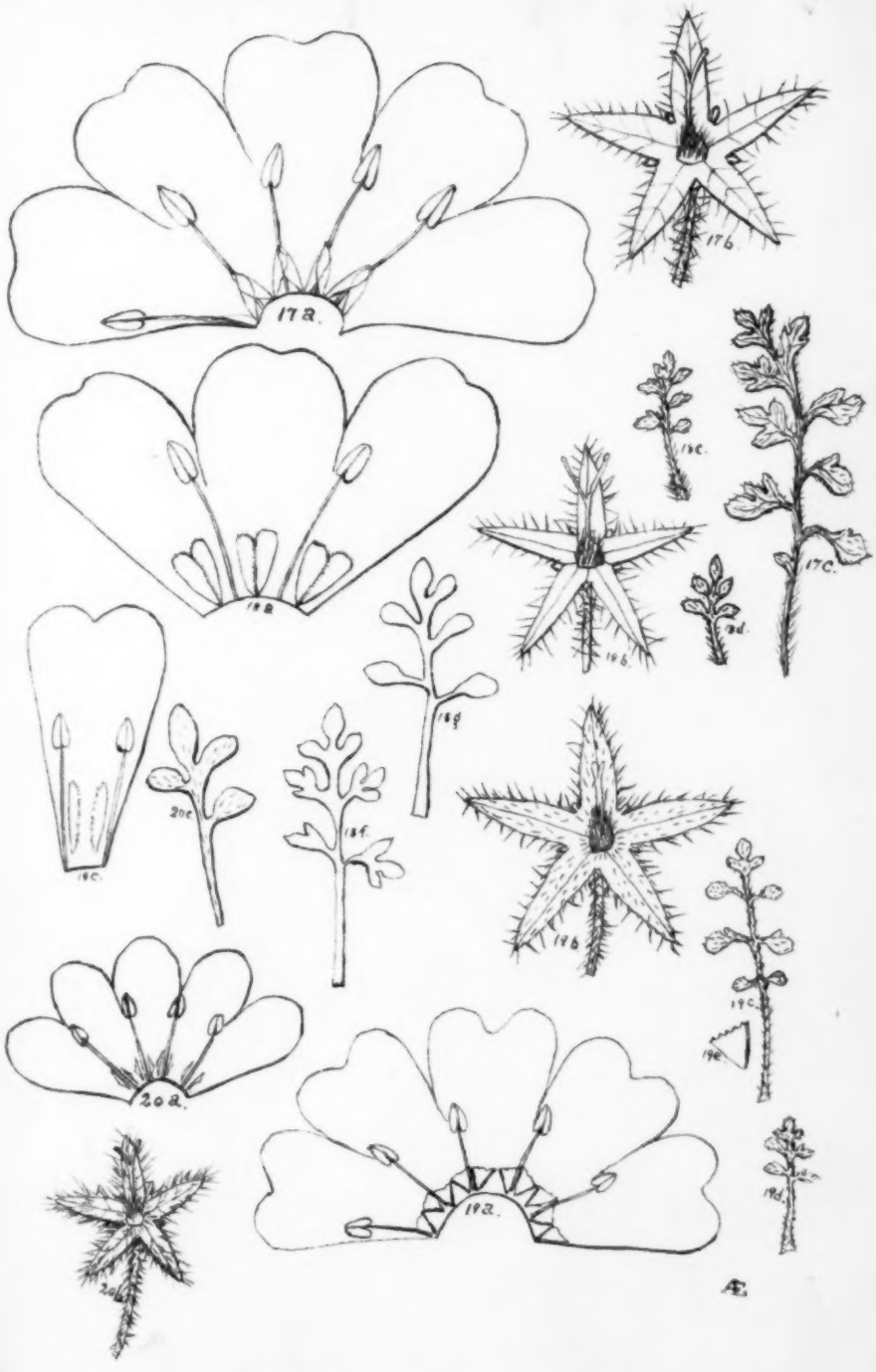


7. Nemophila pustulata 8. N. micrantha. 9. N. Kelloggii. 10. N. Plaskettii.

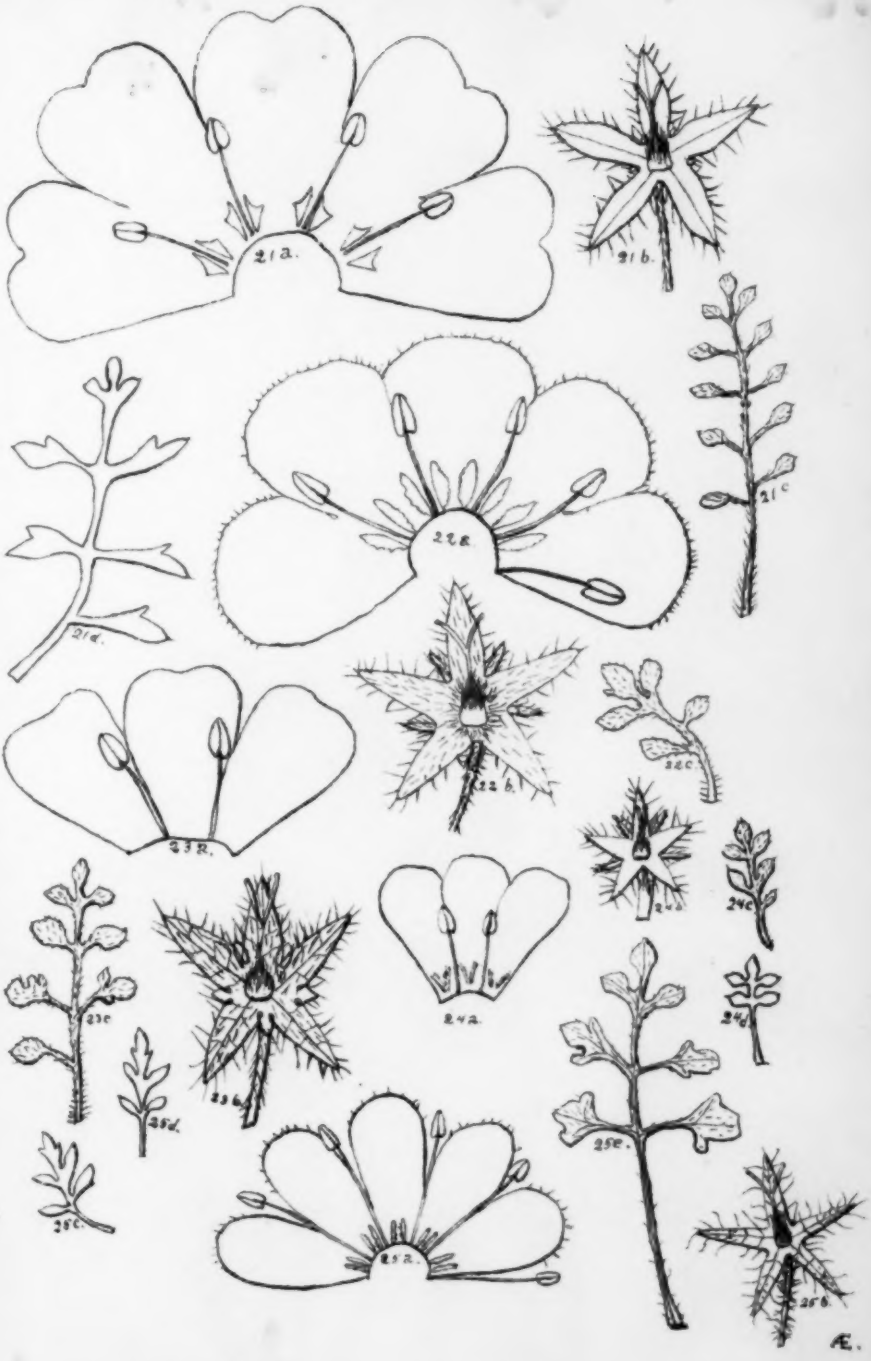
THE HELIOTYPE PRINTING CO., BOSTON.



11. Nemophila exilis. 12. N. humilis. 13. N. nana. 14. N. Congdoni.

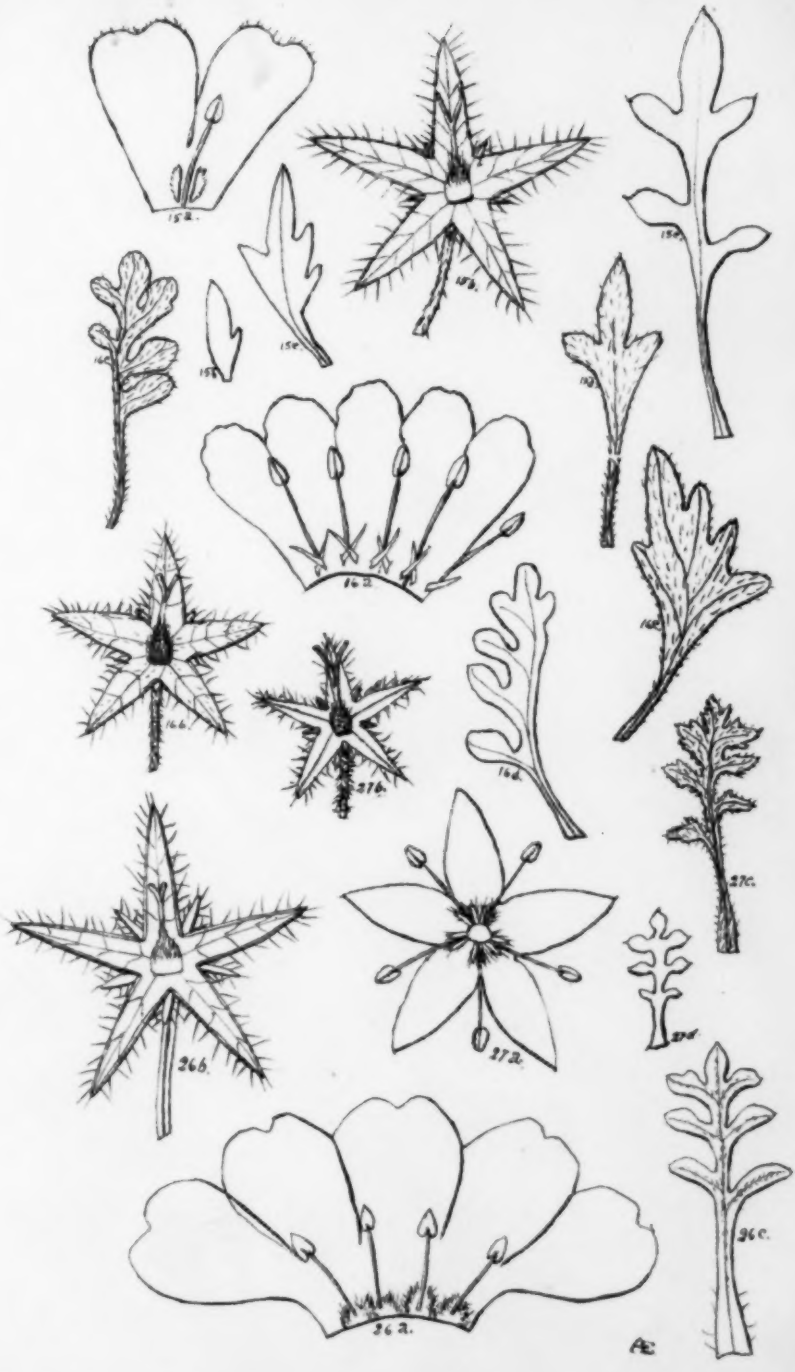


17. Nemophila hispida. 18. N. divaricata. 19. N. tenera. 20. N. gracilis.



21. Nemophila nemorensis. 22. N. glauca. 23. N. fallax. 24. N. exigua. 25. N. pulchella.

THE HELIOTYPE PRINTING CO., BOSTON.



15. Nemophila flaccida. 16. N. inaequalis. 26. N. alata. 27. N. rotata.

THE HELIOTYPE PRINTING CO., BOSTON.